

Taylorcraft 20cc ARF

Assembly Manual

HANGAR 9®

Fly First Class™

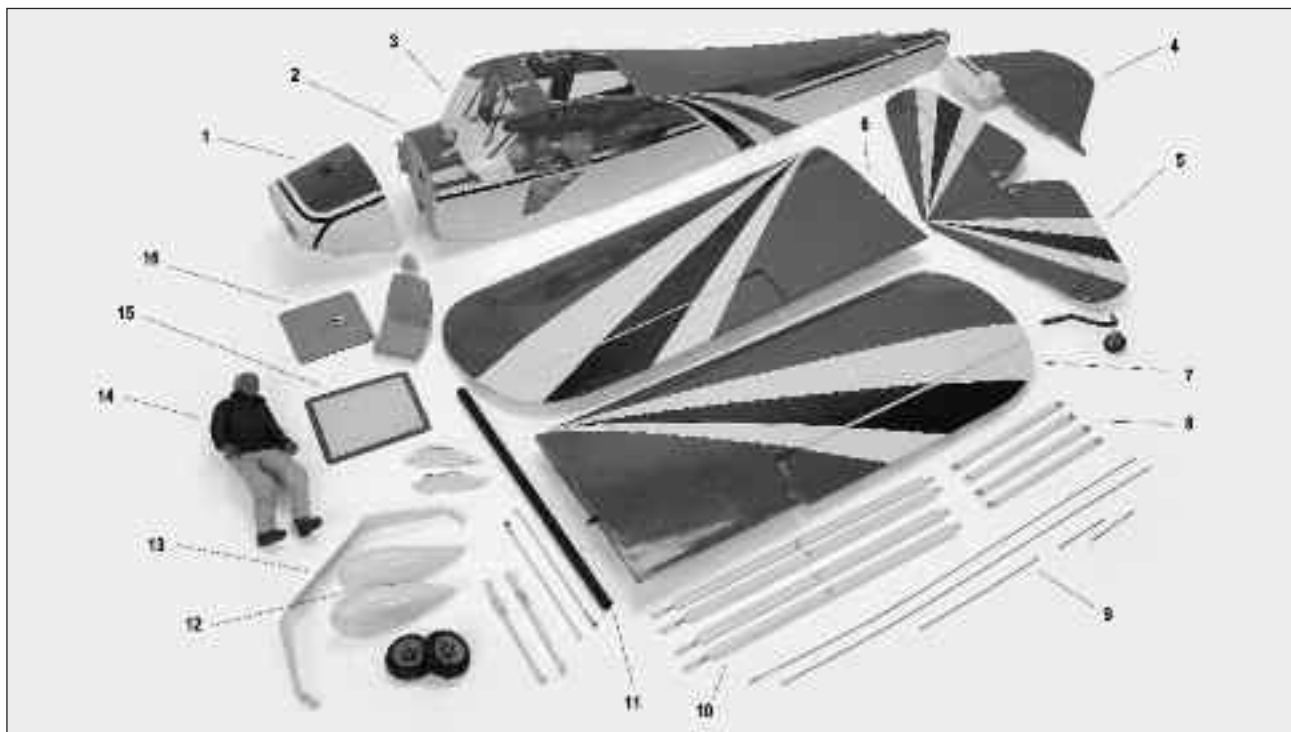


Specifications

Wingspan:	80.5 in (2045.5mm)
Length:	63.7 in (1618mm)
Wing Area:	1152.73 sq in (74.4 sq dm)
Weight:	13-14.5 lb (5.90-6.58 kg)
Radio:	4-channel w/6 servos
Engine:	1.00–1.60 2-stroke; 1.20–1.80 4-stroke; 20–26cc gas; Power110

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Contents of Kit and Parts Layout

Replacement Parts

1. HAN4907	Cowl	11. HAN4910	Wing Tube
2. HAN4901	Fuselage with Top Hatch	12. HAN4912	Wheel Pants
3. HAN4906	Windshield	13. HAN4908	Landing Gear
4. HAN4913	Fin and Rudder	14. HAN4566	Pilot
5. HAN4905	Stabilizer	15. HAN4902	Top Window
6. HAN4903	Left Wing Panel	16. HAN4915	Seat and Mounting Panel
7. HAN4904	Right Wing panel		
8. HAN4909	Stabilizer Strut Parts	Not Illustrated	
9. HAN4917	Pushrods	HAN4914	Engine Standoffs for G20EI
10. HAN4911	Wing Strut Assembly LR	HAN4916	Small Parts Bag

Included Hardware

Packaged in Kit

Fuselage	(1)
Right Wing with aileron & control horn	(1)
Left Wing with aileron & control horn	(1)
Fin with rudder & control horn	(1)
Stabilizer with elevators & control horns	(1)
Cowling	(1)
Windshield	(1)
Wheel pants (pair)	(1)
Landing gear	(1)
3-inch Pro-Lite wheel	(2)

Window and Seat Bag

Top window	(1)
#4 x 1/4-inch screw	(12)
Seat	(1)
Radio compartment cover	(1)
22-inch hook & loop strap	(1)

Landing Gear Bag

Simulated springs	(2)
Landing gear cuffs	(2)
6-32 x 3/4-inch button head hex screw	(6)
6-32 x 1/2-inch button head hex screw	(4)
#6 steel washers	(12)
6-32 nylon lock nut	(2)
5/16-inch wheel collars	(2)
3mm x 6mm socket head cap screws	(4)
7/64-inch Allen wrench	(1)
4-40 x 1/2-inch socket head cap screw	(4)
#4 steel washers	(4)
1 3/4-inch axle with nut	(2)

Aileron Bag

#2 x 1/4-inch self-tapping screws	(8)
20mm x 20mm x 10mm hardwood block	(4)

Fuel Tank Bag

17oz assembled fuel tank	(1)
#64 rubber band	(2)
Aluminum fuel line stopper	(1)

Engine Mount Bag

28mm Aluminum standoff	(4)
8-32 x 1 1/2-inch button head Allen screw	(4)
8-32 x 1 1/4-inch machine screw	(4)
8-32 x 3/4-inch button head Allen screw	(4)
8-32 blind nut	(4)
8-32 nylon lock nut	(4)
#8 steel washers	(8)
Aluminum engine mount	(2)
4-40 x 1/2-inch button head Allen screw	(4)
#4 steel washer	(4)

Tailwheel Bag

Tailwheel assembly with wheel	(1)
Springs	(2)
Tiller arm	(1)
#2 x 5/8-inch self-tapping screws	(2)
#4 x 3/4-inch socket head wood screws	(2)
#4 steel washers	(2)

Tail Flying Wire Bag

Bottom strut supports	(4)
Top flying wire	(2)
4-40 steel rod end	(2)
4-40 hex nut	(2)
4-40 x 1/4-inch button head Allen screw	(4)
4-40 x 5/8-inch button head Allen screw	(5)
#4 steel washers	(6)
Brass tab	(2)
Aluminum tab	(1)

Control Hardware Bag

89-inch coated control cable	(1)
4-40 steel clevis	(6)
4-40 rigging coupler	(4)
4-40 hex nut	(6)
6-32 x 1-inch button head Allen screw	(4)
#6 steel washer	(4)
Copper crimp	(4)
Nylon clevis	(1)
Snap link	(1)
2-56 ball link with hardware	(1)
4-40 ball link with hardware	(6)
1/4-20 x 1 1/2-inch nylon bolt	(2)
Silicone clevis keepers	(10)

Strut Hardware Bag

4-40 x 3/8-inch button head Allen screw	(4)
4-40 x 1/2-inch button head Allen screw	(4)
4-40 x 5/8-inch socket head cap screw	(4)
4-40 nylon lock nut	(8)
#4 steel washer	(4)
5mm hex nut	(4)
Silicone pin spacer	(4)
Strut pin & keeper	(4)
Strut end	(4)
Strut bracket (fuselage)	(2)
Strut bracket (wing)	(4)
Jury strut fitting	(4)
Jury strut	(6)
Forward strut	(2)
Rear strut	(2)

Pushrod Bag

4-40 x 3/2 1/4-inch pushrod	(2)
4-40 x 4 5/16-inch pushrod	(2)
2-56 x 13-inch pushrod	(1)
8-inch nylon pushrod housing	(1)
21 3/4 x 3/4-inch aluminum wing tube	(1)

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 completed sections. Steps with a single box () are performed once, steps with two boxes () indicate that the step needs to be repeated, such as for left and right wing panel, or two servos etc.

Before beginning it is a good idea to read through the manual completely to familiarize yourself with the assembly process. Remember to take your time and follow the directions.

UltraCote® Covering Colors

- | | |
|-----------------------------|---------|
| ● White | HANU870 |
| ● Black | HANU874 |
| ● True Red | HANU866 |
| ● 2-inch squares, Red/White | HANU944 |

Before Starting Assembly

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

Any wrinkles in the covering can be removed with a heat gun or covering iron. Use caution while working around edges and areas where colors overlap to prevent separating the covering.

Workspace Preparation

During the course of building your Taylorcraft we suggest that you use a soft base on the building surface. Such things as a foam stand, large piece of bedding foam or a thick bath towel will work well and help protect the model from damage during assembly.

A flat area measuring at least 24 x 72-inches is required to work on the model sub-assemblies comfortably. The completed and assembled model requires a space of 72 x 90-inches. Ensure you have adequate lighting, and a place to set aside parts that have been completed.

Radio System Requirements

Spektrum Radio System

- DX7 7-channel radio with receiver (SPM2710)
- JRPS821 DS821 Digital Sport servo (5)
- JRPS537 Standard servo for throttle (not required for EP version)
- JRPA098 12-inch servo extension (4)
- JRPA004 Deluxe Chargeswitch
- JRPB5008 2700mAh receiver battery

Optional Item

- 2-1/2" Aluminum Spinner (TRU2502B120)

Recommended Setup—Gas

- Zenoah G20EI (ZENE20EI)
- Evolution propeller 16x6 (EVO16060)
- Deluxe Chargeswitch (JRPA004)
- Ignition Battery 4500mAh (JRPB5004)
- Gas fuel tubing (DUB799)

Recommended Setup—Electric

- E-flite Power 110 (EFLM4110A)
- Phoenix HV-85 ESC (CSEPHX85HV)
- Thunder Power 4S 5000mAh Li-Po (2)
- APC Propeller 18x8E (APC18080E)

Recommended Setup—2-stroke Glow

- Evolution 1.20NX with muffler (EVOE1200)
- Evolution propeller 16x6 (EVO16060)

Recommended Setup—4-stroke Glow

- Saito FA-125A (SAIE125A)
- Evolution propeller 16x6 (EVO16060)

Important Warranty Information

Please read our Warranty and Liability Limitations section on Page 52 before assembling this product. If you as the purchaser 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.

Required Tools and Equipment

Drill	Pin vise
Low-tack tape	Pliers
Ruler	Sidecutters
File	Felt-tipped pen
Pencil	Medium grit sandpaper
Tapered reamer	Hobby knife (#11 blade)
Dental floss	Manila card stock
Alcohol	Paper towels
Crimping pliers	Double-sided adhesive tape
Mixing sticks	Mixing cups
Needle nose pliers	Scissors
Rotary tool with sanding drum	
Cable ties: small (4-inch), medium (7-inch)	
Phillips screwdriver: #0, #1	
Hex wrench or balldriver: 5/64, 3/32, 1/8-inch	: 1.5, 2.5, 3, 4mm
open-end wrench: 3/16, 1/4, 9/32, 5/16-inch	: 10, 13mm
Drill bit: 1/32, 11/64, 3/32, 11/64, 3/16, 13/64, 1/4-inch	

Required Adhesives

Thin CA	(PAAPT08)
Medium CA	(PAAPT02)
12-minute epoxy	(HAN8001)
Threadlock	(PAAPT42)
Canopy glue	(PAAPT56)

Other Required Items

12-inch extension leads (JRPA098) (4)
Fuel dot filler (HAN115)
Heavy-duty servo arms (JRPA215)
1/4-inch foam rubber (DUB513)

Product Registration

Horizon Hobby wants to ensure that you get maximum enjoyment from your Hangar 9 products. We strongly encourage you to register your product using the online Product Registration tool so we can notify you when there are service bulletins, new option parts or accessories, or updates available for your product.

Register your product today at:
<http://www.hangar-9.com/Register/>

Optional Accessory

Setting up servos is a whole lot easier with a JR® MatchMaker™. It lets you accurately center servos, evaluate endpoints, and cycle servos at varying speeds, without ever having to switch on a transmitter. It allows the precise digital centering of up to 2 servos at a time to help with setup on the building bench.



Work Area Cleanliness

It is a good practice to maintain a clean work area, both to prevent damage to your model and to keep track of parts and hardware. Put away any tools not being used, and set aside parts of the model that are not being worked on.

Of special importance is keeping debris out of sensitive components such as the radio and engine or motor. Tape over engine intake and exhaust ports when drilling or cutting the firewall and cowling to prevent causing damage to the internal components.

Hardware Practices

When installing hardware that consists of a button head machine screw, washer and nut, use an open-ended or box wrench to tighten the nut while holding the fastener with a hex wrench. The washer provides a bearing surface for the nut while it is being turned, holding the screw with a wrench prevents damage to the part, particularly on painted components.

Rudder and Elevator Servo Installation

Required Parts

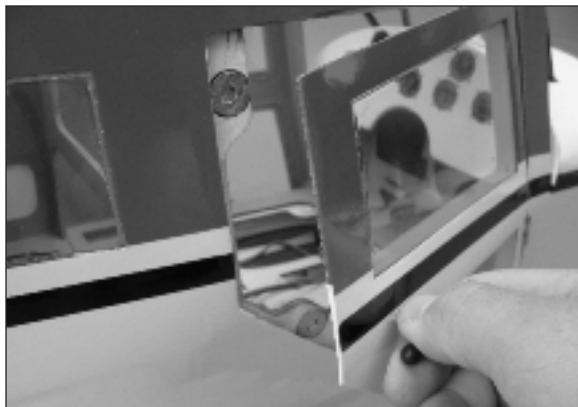
Fuselage Servos with hardware (3)

Required Tools

Thin CA #1 Phillips screwdriver

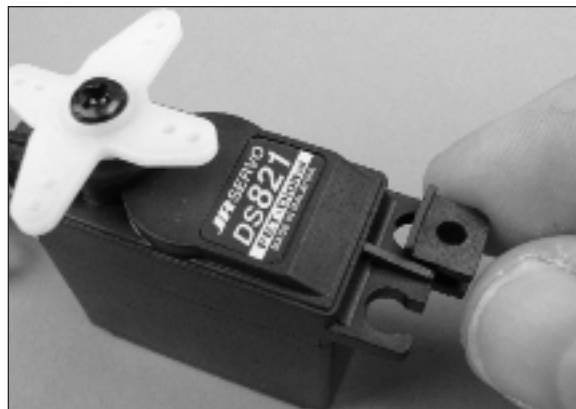
Step 1

Open the cockpit door by pulling on the handle. The door is held closed with magnets, the handle does not need to be turned.



Step 2

Insert the rubber grommets into the servos.



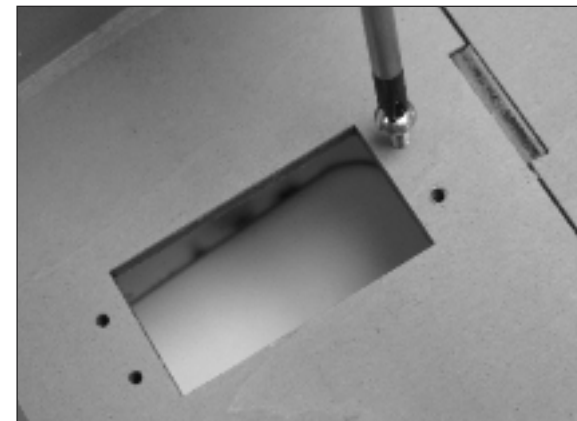
Step 3

Insert the brass bushings in the servos. Note that the flange is located on the lower side of the servo.



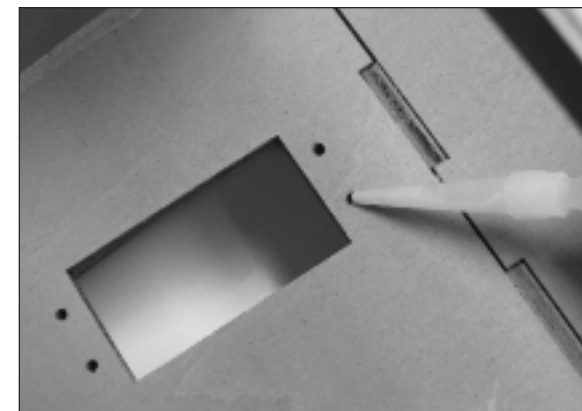
Step 4

Use a #1 Phillips screwdriver to install a servo screw in each of the pre-drilled holes in the servo tray.



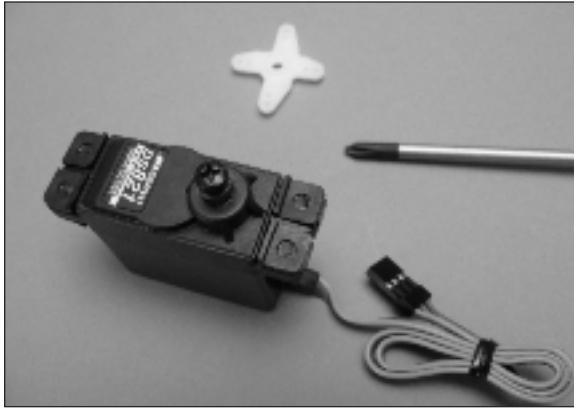
Step 5

Remove the servo screw and apply a drop of thin CA in each hole to strengthen the wood.



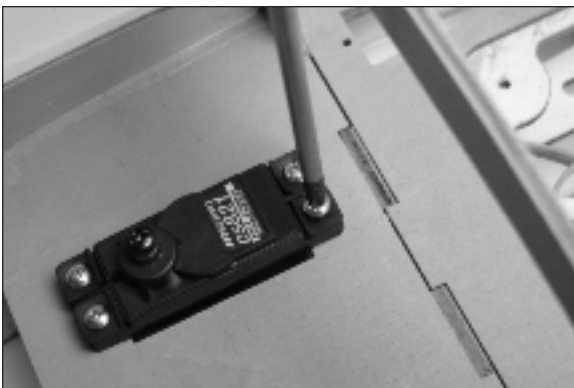
□□□ **Step 6**

Use a #1 Phillips screwdriver to remove the stock servo arms from the servos. Replace the servo screw.



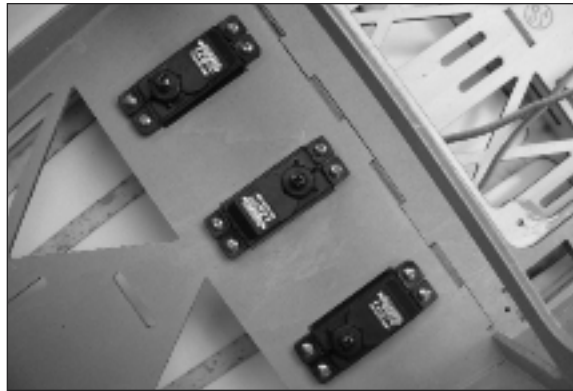
Step 7

Use a #1 Phillips screwdriver to install the rudder and elevator servos. The elevator servos (outer locations) have the output shaft towards the tail, the rudder servo mounts in the center with the output shaft forward.



Step 7

This shows the rudder and elevator servos installed.



Step 8

Route the servo leads forward into the radio compartment through the holes in the bulkhead.



Tail Installation

Required Parts

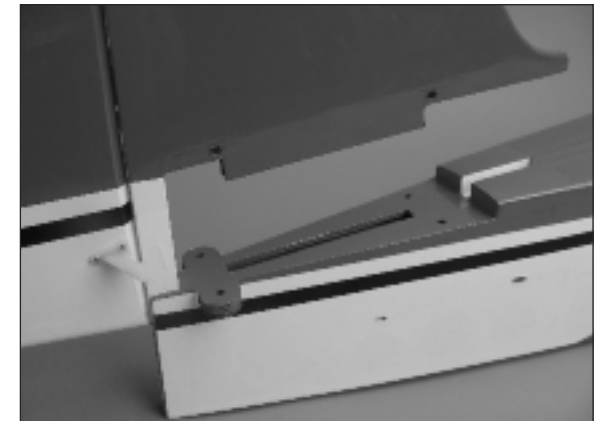
Fuselage Fin with rudder
Stabilizer with elevators

Required Tools

Threadlock 3/32-inch hex wrench

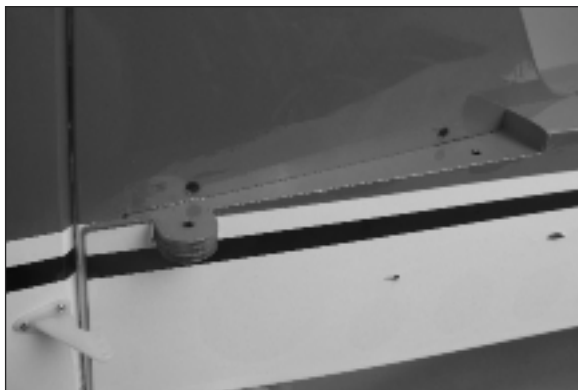
□ **Step 1**

Engage the fin post in the slot in the rear of the fuselage behind the hold-down plate.



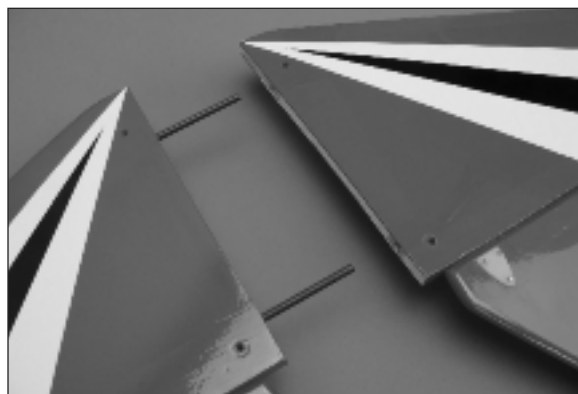
□ **Step 2**

Slide the fin down until it is fully engaged in the fuselage slots.



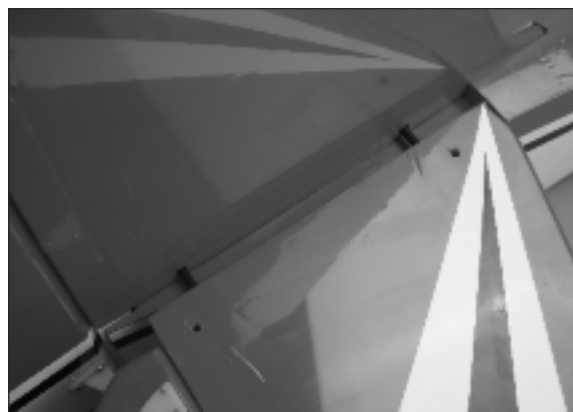
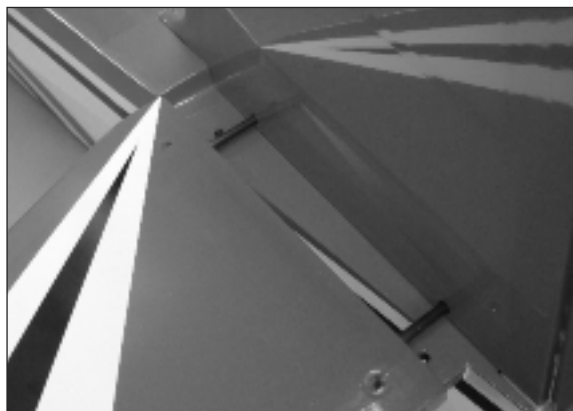
□ **Step 3**

Separate the stabilizer halves from each other.



□ **Step 4**

Slide the stabilizer joiner rods through the holes in the base of the fin and slide the stabilizer halves against each side of the fin.



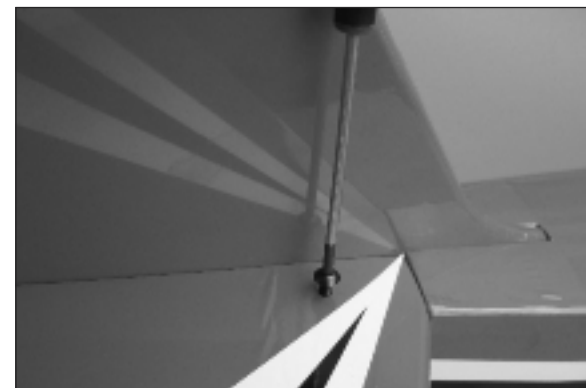
□ **Step 5**

Locate the four 6-32 x 1-inch button head hex bolts. Place a drop of threadlock on the end of the threads.



□ **Step 6**

Use a 3/32-inch hex wrench to install the four stabilizer bolts. Use care to not tighten the bolts excessively and crush the stabilizer structure.



Elevator Pushrod and Rudder Pull-Pull Cable Installation

Required Parts

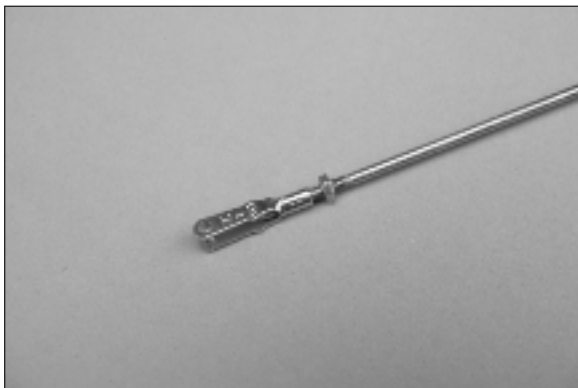
Fuselage	Elevator pushrods (2)
4-40 hex nut (6)	Pull-pull cable
4-40 clevis (6)	4-40 ball link (6)
Copper crimp (4)	4-40 rigging coupler (4)
HD servo arm	180-degree servo arm (2)

Required Tools

Pin vise	3/32-inch drill bit
1/4-inch wrench	5/64-inch hex wrench
Threadlock	Pliers
Sidecutters	Crimping pliers
3/16-inch wrench	

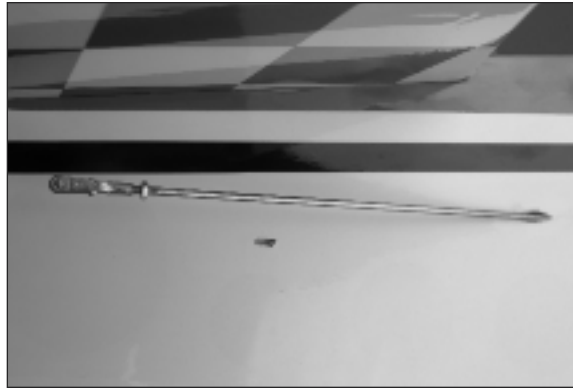
□□ Step 1

Prepare the elevator pushrods by threading a 4-40 hex nut and 4-40 clevis onto one end.



□□ Step 2

Insert the elevator pushrod into the pushrod housing opening in the rear of the fuselage side.



□□ Step 3

Use a 3/32-inch drill bit in a pin vise to enlarge the outer hole in a standard 180 degree servo arm.



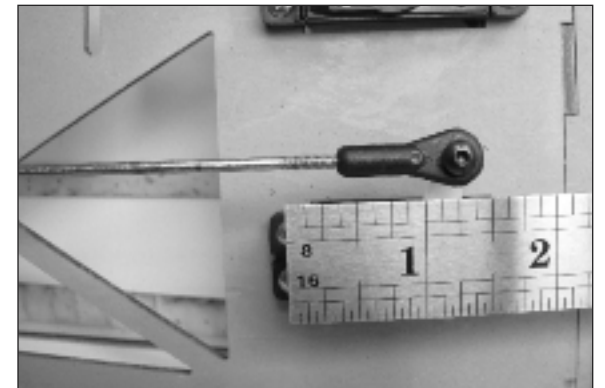
□□ Step 4

Use a 5/64-inch hex driver and 1/4-inch wrench to install a 4-40 ball link onto the servo arm.



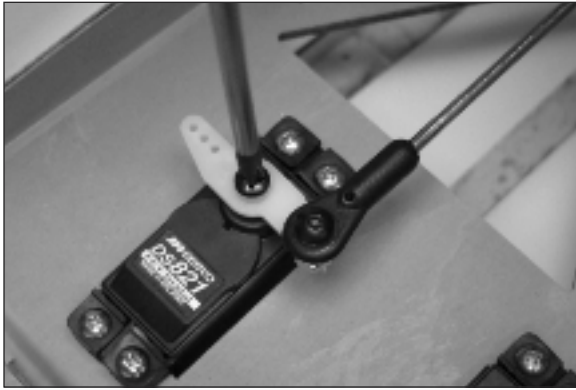
□□ Step 5

Thread the ball link and servo arm onto the servo end of the elevator pushrod until approximately 3/8-inch of thread remains exposed.



□□ **Step 6**

Use your radio or a JR MatchMaker to center the elevator servo and install the servo arm using a #1 Phillips screwdriver.



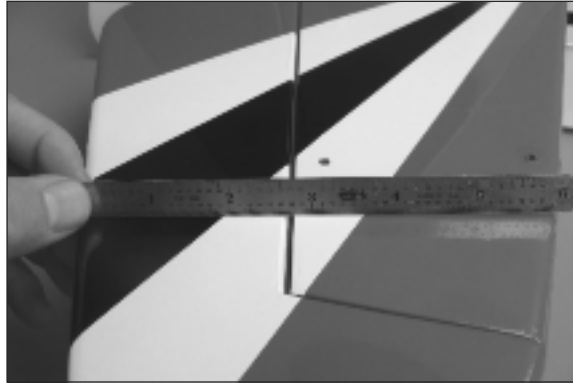
□□ **Step 7**

Adjust the clevis so that the elevator is centered when connected to the center hole in the elevator horn.



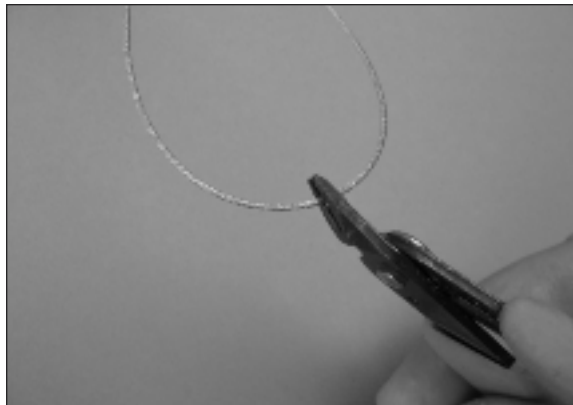
□□ **Step 8**

Use a ruler to check the alignment of the elevator with the stabilizer as the clevis is being adjusted.



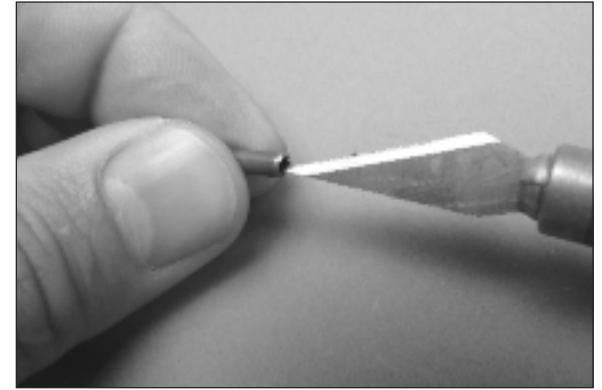
□ **Step 9**

Locate the coil of coated steel pull-pull cable. Uncoil the cable and fold it against itself to find the center. Use sidecutters to cut the cable into two equal lengths.



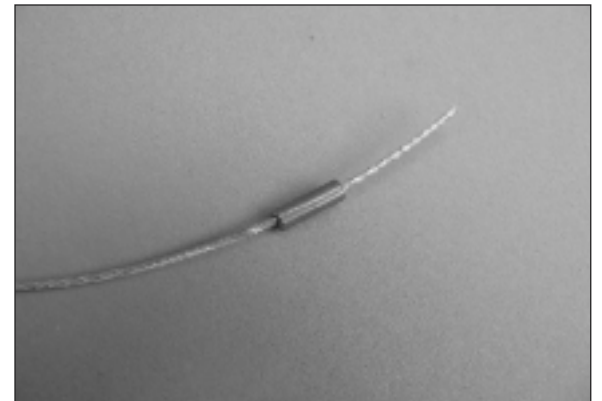
□□ **Step 10**

Use a hobby knife with a #11 blade to deburr the inside of each end of the copper crimp. This will make it easier to double the cable through the crimp.



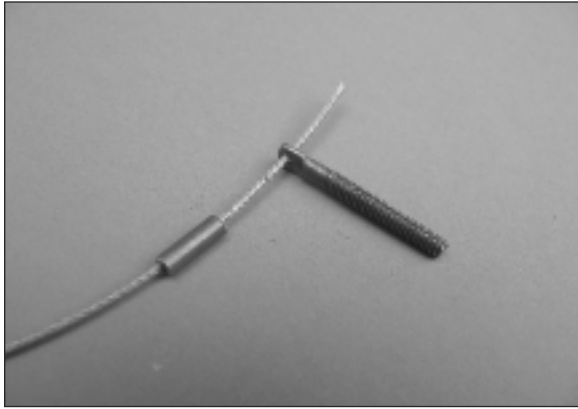
□□ **Step 11**

Slide a copper crimp onto the end of the pull-pull cable.



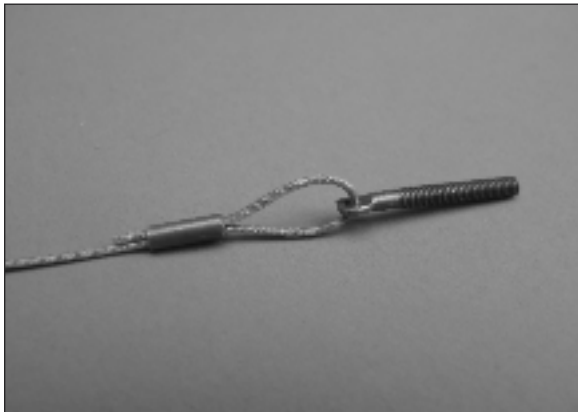
□□ **Step 12**

Slide a 4-40 rigging coupler onto the cable next to the copper crimp.



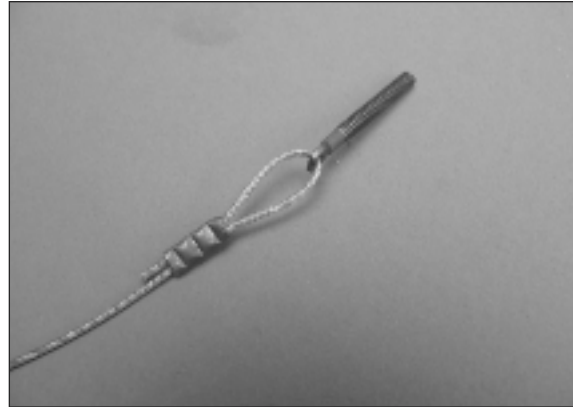
□□ **Step 13**

Fold the cable back on itself and insert the free end through the copper crimp. Form a loop approximately 5/8-inch long containing the rigging coupler, and leave about 3/16-inch protruding from the crimp.



□□ **Step 14**

Use crimping pliers or sidecutters on the copper crimp to secure the cable end. Use care not to cut completely through the cable.



□□ **Step 15**

Thread a 4-40 ball link assembly onto the rigging coupler. Use pliers to grip the coupler while threading the ball link on.



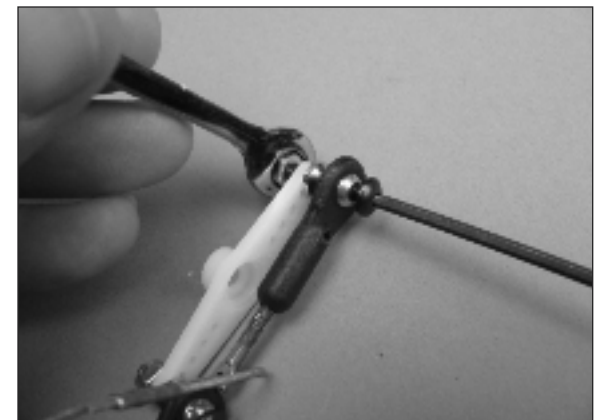
□ **Step 16**

Use a 3/32-inch drill bit in a pin vise to enlarge the outer hole in each end of a JR heavy-duty servo arm.



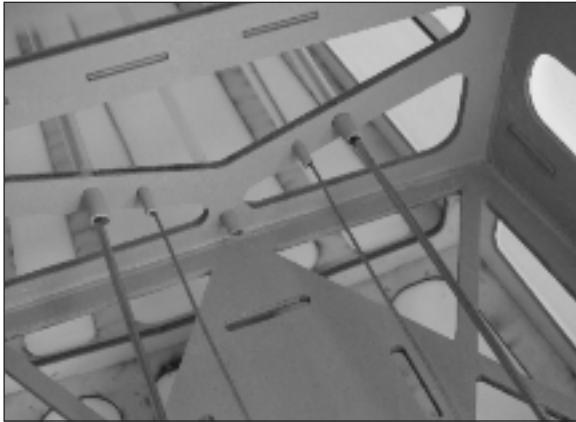
□ **Step 17**

Use a 5/64-inch hex wrench and 1/4-inch open-end wrench to install the ball link and cable assemblies onto the servo arm.



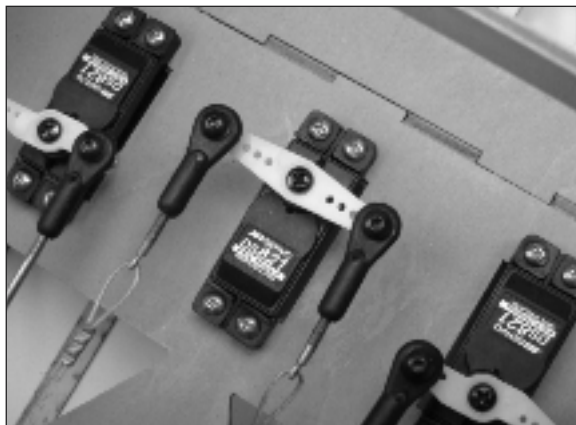
□ **Step 18**

Feed the free end of each rudder pull-pull cable into the guide tubes inside the fuselage. The tubes are located in the first bulkhead behind the servo tray.



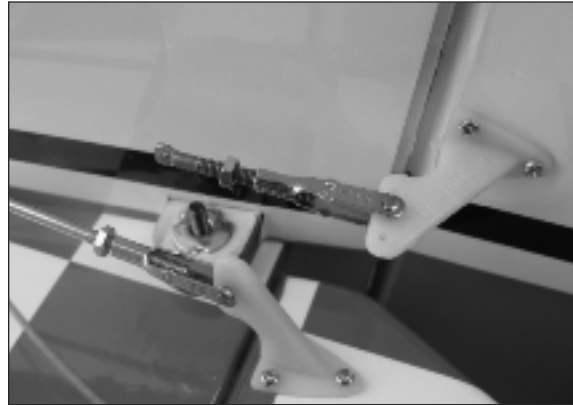
□ **Step 19**

Use your radio or JR Matchmaker to center the rudder servo, and use a #1 Phillips screwdriver to secure the arm to the servo.



□□ **Step 20**

Invert the fuselage on the work table. Install a 4-40 hex nut and clevis on a rigging coupler so that about three threads protrude from the barrel of the clevis. Attach the clevis to the middle hole in the rudder horn.



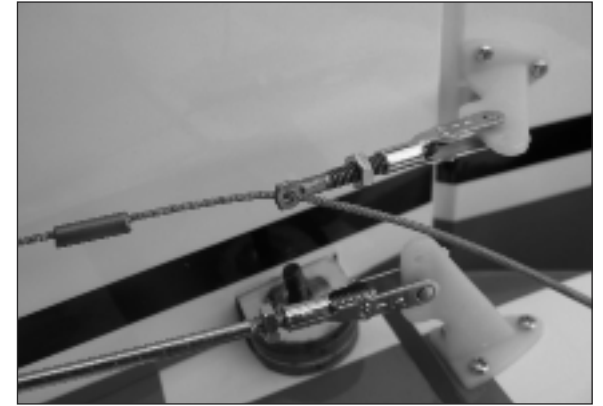
□□ **Step 21**

Slide a copper crimp onto the pull-pull cable.



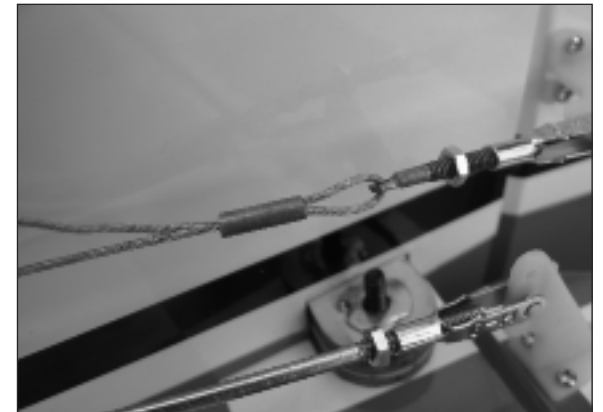
□□ **Step 22**

Insert the free end of the pull-pull cable through the hole in the end of the rigging coupler.



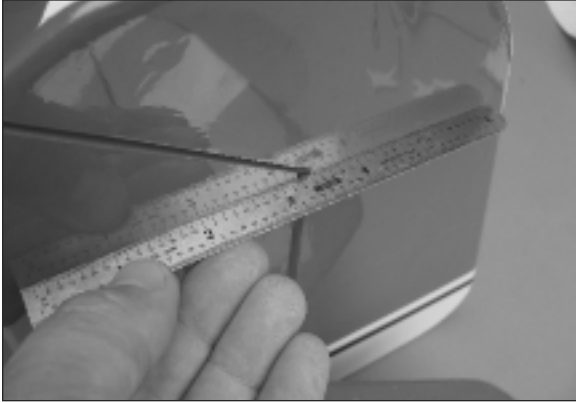
□□ **Step 23**

Insert the free end of the pull-pull cable through the copper crimp.



□ **Step 24**

Adjust the pull-pull cables in the rigging couplers to center the rudder and remove slack from the cables. Use a ruler to check the alignment of the rudder to the fin while making the adjustments.



□□ **Step 25**

Check that the rudder servo arm and rudder are centered then use crimping pliers or sidecutters to secure the copper crimp to the pull-pull cables.



□□ **Step 26**

Use sidecutters to trim the excess cable protruding from the crimp.



□□ **Step 26**

Place a drop of threadlock on the threads of the rigging coupler between the clevis and the hex nut.



Step 27

Use a 3/16-inch open-end wrench to tighten the hex nut against the clevis.



□□ **Step 28**

Repeat steps 26 and 27 to secure the hex nuts against the elevator clevises.

Tailwheel Installation

Required Parts

Fuselage	Tailwheel assembly
Tiller arm	Springs
#4 washer (2)	
#4 x 3/4-inch socket head cap screw	
#2 x 5/8-inch self-tapping screws	
Aluminum tab from tail brace parts bag	

Required Tools

Pin vise	1/32-inch drill bit
Felt-tipped pen	Thin CA
2.5mm hex wrench	Needle nose pliers
3/32-in hex wrench	#1 Phillips screwdriver

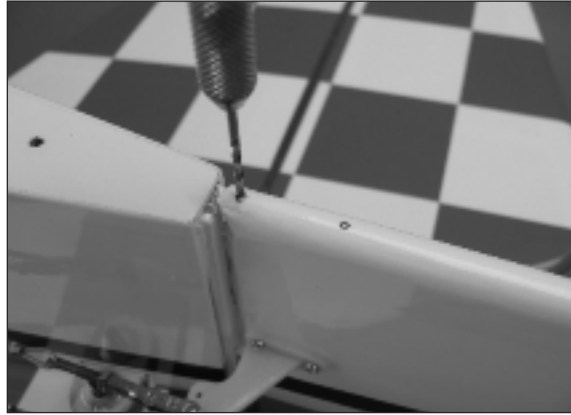
□ Step 1

Invert the fuselage on the work table. Place the tiller arm on the bottom of the rudder with its edge aligned with the forward edge of the rudder. Mark the mounting holes with a felt-tipped pen.



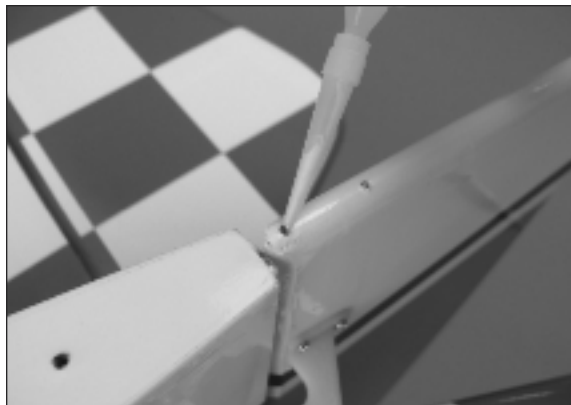
□ Step 2

Use a 1/32-inch drill in a pin vise to drill the mounting holes for the tiller arm screws.



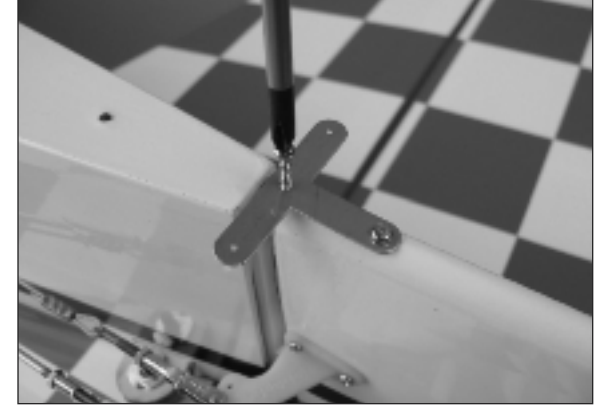
□ Step 3

Place 3–4 drops of thin CA in each of the holes to strengthen the wood around the holes. Do not use accelerator as the CA needs to fully penetrate the wood.



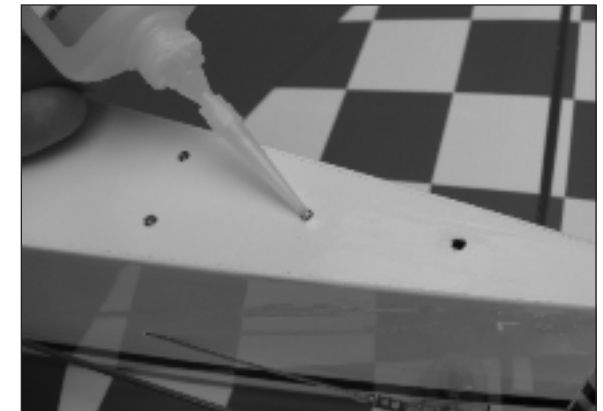
□ Step 4

Use a #1 Phillips screwdriver to install the tiller arm with two #2 x 5/8-inch self-tapping screws.



□ Step 5

Apply a 1–2 drops of thin CA to each of the tailwheel mounting holes. Do not use accelerator as the CA needs to fully penetrate the wood.



□ **Step 6**

Place the tailwheel assembly over the mounting holes on the rear fuselage. Use a 3/32-in hex wrench to install a #4 x 3/4-in socket head wood screw and #4 steel washer in the forward mounting hole.



□ **Step 7**

Locate the aluminum mounting tab from the tail brace parts bag.



□ **Step 8**

Place the aluminum tab on the tailwheel assembly over the rear hole. Use a 3/32-in hex wrench to install the second mounting screw and washer.



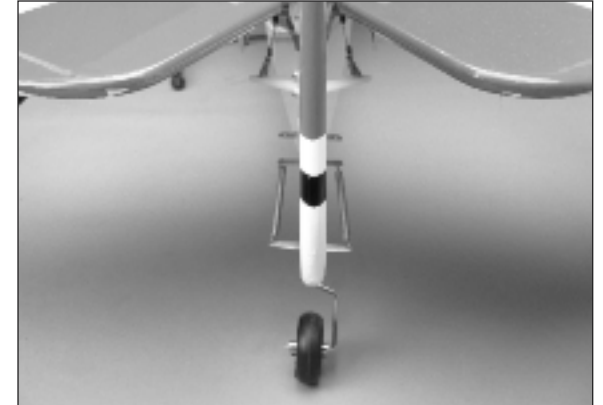
□ **Step 9**

Use needle nose pliers to bend a loop in each end of the tailwheel steering springs and attach them to each end of the steering tiller on the rudder and tailwheel assembly.



□ **Step 10**

The springs should be under slight tension when installed. Form the springs to approximately equal lengths and adjust as necessary to align the tailwheel with the rudder.



□□ **Step 6**

Locate the 10 1/4-inch lower rear stabilizer strut. Install it on the lower surface of the stabilizer over the screw inserted in Step 5 and thread on a 4-40 nylon lock nut.



□□ **Step 7**

Use a 5/64-inch hex wrench and 1/4-inch open-end wrench to tighten the brass strap and rear strut to the stabilizer.



□□ **Step 8**

Attach the inboard end of the rear strut to the top of the aluminum tab with a 4-40 x 1/4-inch button head machine screw and 4-40 nylon locknut.



□□ **Step 9**

Use a 5/64-inch hex wrench and 1/4-inch open-end wrench to tighten the rear strut to the aluminum tab.



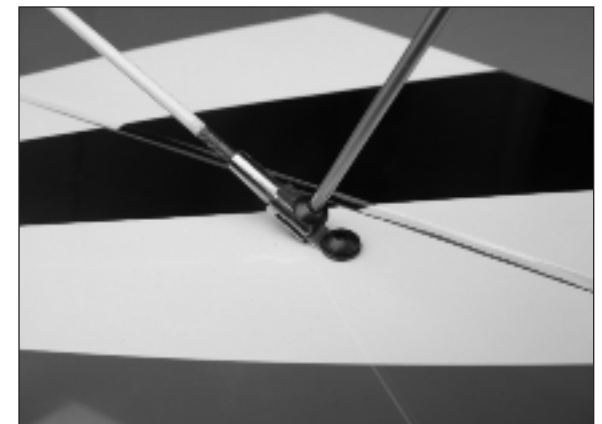
□□ **Step 10**

Thread a 4-40 rod end onto the threaded section of the upper brace wire and adjust it until the hole is aligned with the hole in the brass tab.



□□ **Step 11**

Place a small amount of threadlock on a 4-40 x 1/4-inch button head machine screw and install it with a 5/64-inch hex wrench.



Tail Brace Installation

Parts Required

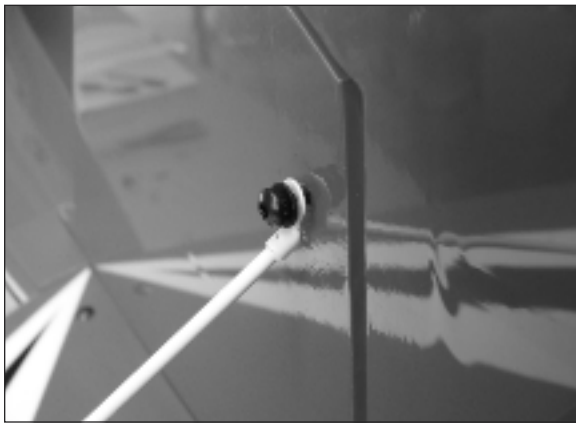
Fuselage	Lower strut (4)
Brass tab (2)	Upper brace wire (2)
4-40 rod end (2)	4-40 hex nut (2)
#4 washer (6)	4-40 nylon lock nut (6)
4-40 x 5/8-inch button head machine screw (5)	
4-40 x 1/4-inch button head machine screw (4)	

Tools Required

5/64-in hex wrench	Threadlock
Needle nose pliers	1/4-inch open-end wrench

□ Step 1

Insert a #4 washer and 4-40 x 5/8-inch button head machine screw through the mounting tab of the upper wire brace and into the rear hole in the fin. Whether the bolt head is on the left or right side is not critical.



□ Step 2

On the opposite side of the fin, place the other wire brace over the protruding screw, then a #4 washer and 4-40 nylon lock nut.



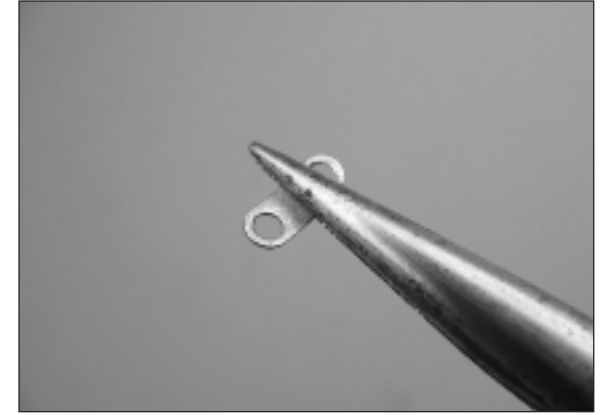
□ Step 3.

Use a 5/64-inch hex wrench and 1/4-inch open-end wrench to tighten the upper brace wires against the fin. Only a snug fit is necessary so as not to crush the structure.



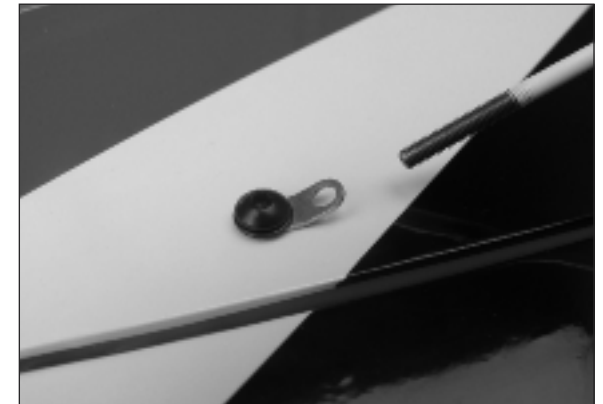
□ Step 4

Use a pair of needle nose pliers to form a bend in the center of each of the brass tabs.



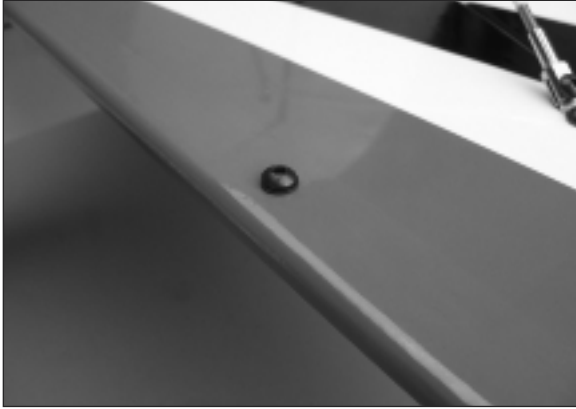
□ □ Step 5

Install the brass tab to the rear hole on the upper surface of the stabilizer with a #4 washer and 4-40 x 5/8-in button head hex screw.



□□ **Step 12**

Place a #4 washer on a 4-40 x 5/8-inch button head machine screw and insert it in the forward hole in the top of the stabilizer.



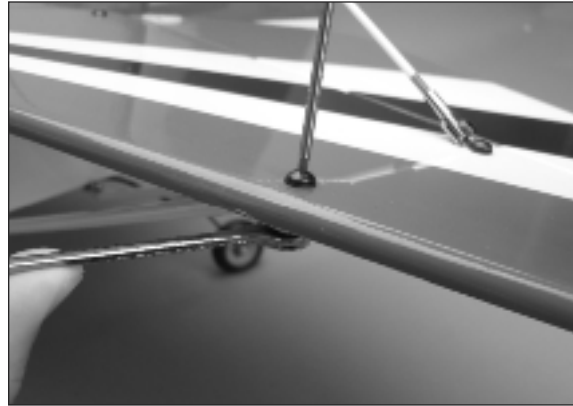
□□ **Step 13**

Place the 10 5/8-inch lower forward strut over the screw and thread on a 4-40 nylon locknut.



□□ **Step 14**

Use a 5/64-inch hex wrench and 1/4-inch wrench to tighten the forward strut against the stabilizer lower surface.



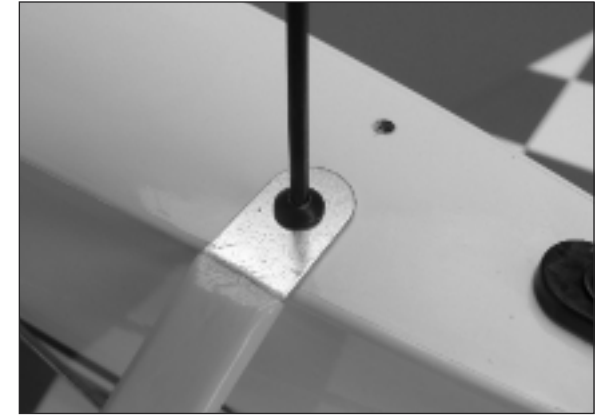
□□ **Step 15**

Place a drop of threadlock on a 4-40 x 5/8-inch button head machine screw.



□□ **Step 16**

Use a 5/64-inch hex wrench to install the forward strut end to the bottom of the fuselage.



□ **Step 17**

Repeat steps 5 through 16 for the opposite side.

Landing Gear Installation

Parts Required

Fuselage	Landing gear
Wheel pants (2)	Wheels (2)
Simulated springs (2)	Landing gear cuffs
#4 washer (4)	5/16-in wheel collar (4)
#6 washer (12)	6-32 nylon locknut (2)
3mm x 6mm hex head cap screws (4)	
4-40 x 1/2-in button head machine screw (4)	
6-32 x 1/2-in button head machine screw (4)	
6-32 x 3/4-in button head machine screw (6)	
1 3/4-in axle with locknut (2)	

Tools Required

2.5mm hex wrench	Low-tack tape
10mm wrench	13mm wrench
Ruler	File
3/32-in hex wrench	5/16-in wrench
5/64-inch hex wrench	Felt-tipped pen

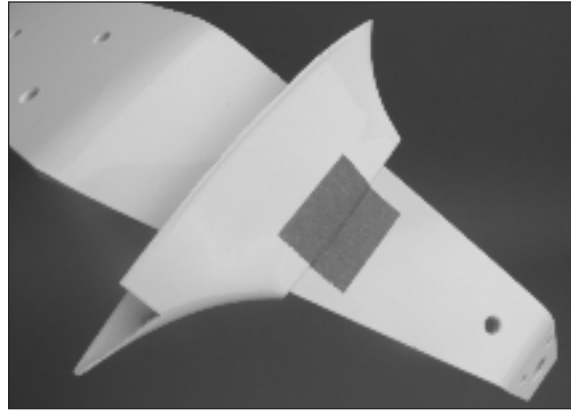
□□ Step 1

Slide the landing gear cuff over the end of the landing gear leg. The cutout in the cuff is located rearwards and outboard on the landing gear leg. Note that the landing gear will angle forward on the airplane.



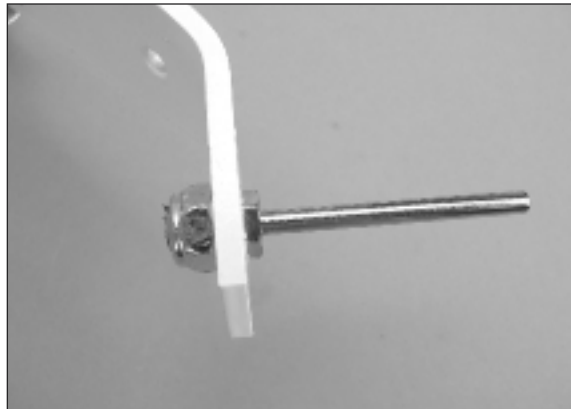
□□ Step 2

Slide the cuff halfway up the gear leg and tape it in place with low-tack tape.



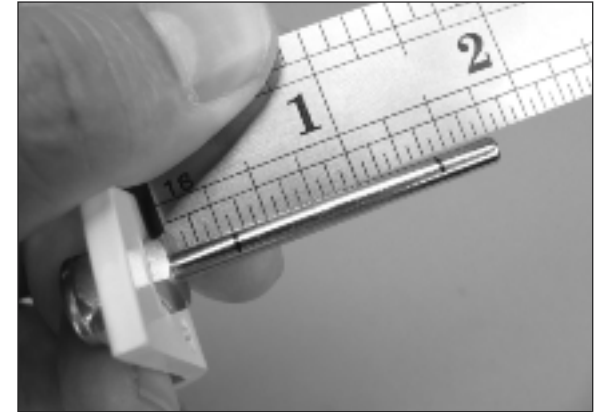
□□ Step 3

Locate the axle and slide its threaded end into the large hole in the landing gear. The axle will face outward. Thread the nut onto the axle. Use a 10mm (axle) and 13mm (nut) wrench to tighten the nut and secure the axle to the landing gear.



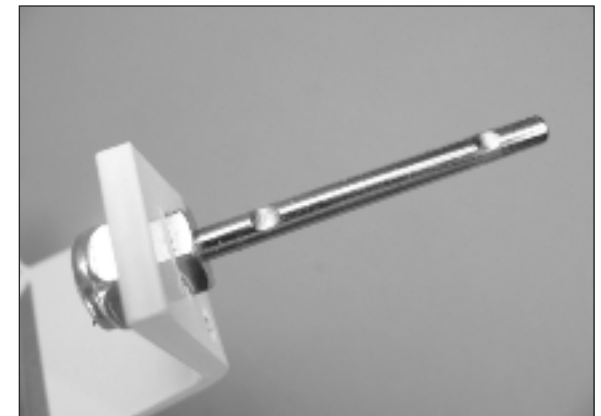
□□ Step 4

Use a ruler and felt-tipped pen to mark two locations on the bottom of the axle, 5/16-in and 1 7/16-in outboard of the axle base.



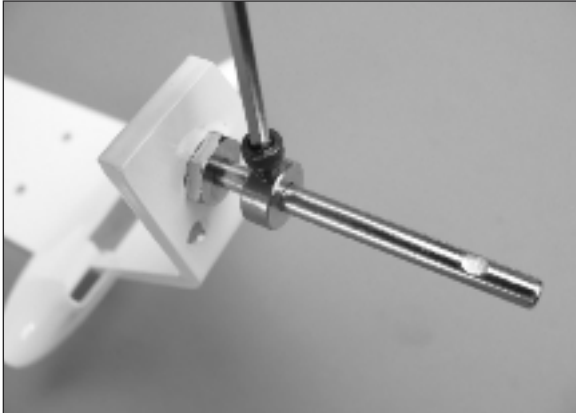
□□ Step 5

Use a file to make a flat spot at the marked locations on the bottom of the axle. This will provide more contact area for the wheel collar screws and help prevent them vibrating loose in flight.



□□ **Step 6**

Slide a 5/16-in wheel collar on the axle to the inner flat spot. Apply threadlock to the 3mm x 6mm cap screw and use a 2.5mm hex wrench to secure the wheel collar to the axle.



□□ **Step 7**

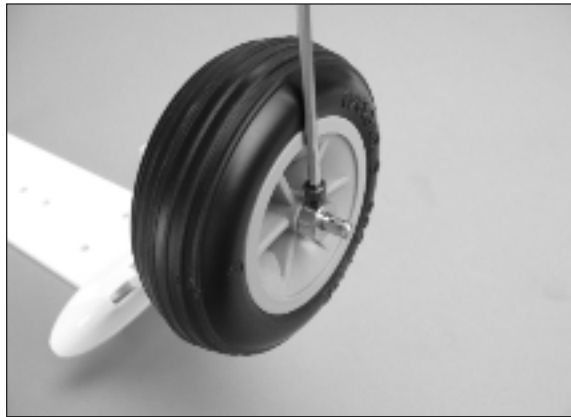
Slide a 3-inch wheel onto the axle.



□□ **Step 8**

Slide a second wheel collar on to the axle against the wheel. Use threadlock on the wheel collar retaining screw and tighten it to the axle on the flat spot using a 2.5mm hex wrench.

Check that the wheel rotates freely, adjust the wheel collar location if necessary. A small drop of lightweight oil can be applied to help the wheel move easily.



□□ **Step 9**

Slide one of the wheel pants over the wheel and into place against the landing gear leg. Note that there is a left and right wheel pant. Slide a #4 washer onto each of the 4-40 x 1/2-inch button head machine screws. Apply a drop of threadlock to each screw and use a 5/64-inch hex wrench to tighten them in place and secure the wheel pant to the landing gear.



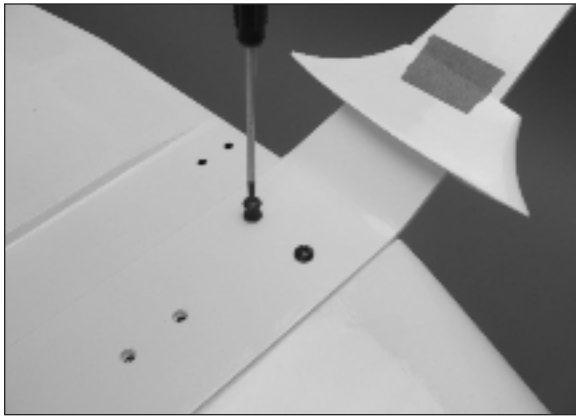
□ **Step 10**

Locate the four 6-32 x 3/4-inch button head machine screws and place a #6 washer on each screw.



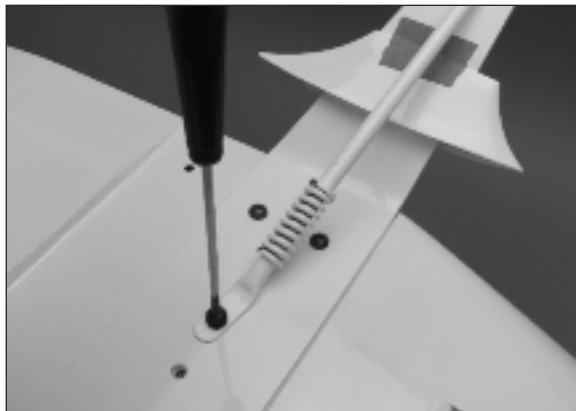
□ Step 11

Place the fuselage inverted on the work table and set the landing gear on the fuselage. Apply a drop of threadlock to each screw and use a 3/32-inch hex wrench to secure the landing gear to the fuselage with the four screws.



□□ Step 12

Place a #6 washer on a 6-32 x 1/2-inch button head machine screw. Apply threadlock to the screw and install the shock strut to the fuselage with a 3/32-inch hex wrench.



□□ Step 13

Attach the lower end of the shock strut to the landing gear leg with a 6-32 x 1/2-inch button head machine screw and 6-32 nylon lock nut. Use a 3/32-inch hex wrench and 5/16-inch wrench to secure the strut to the landing gear leg.



□ Step 14

Repeat steps 1 through 13 for the opposite side.

Gas Engine Installation

Firewall Preparation

Parts Required

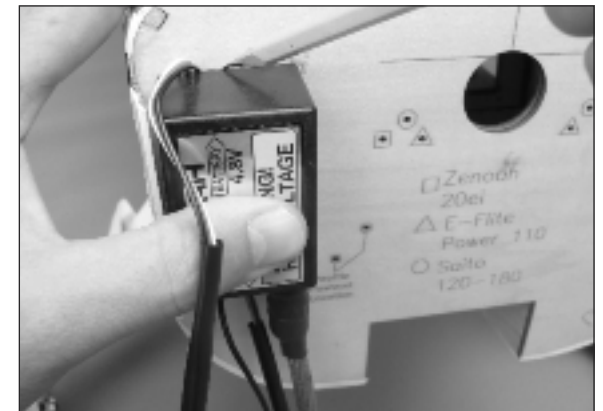
Fuselage	Ignition unit
#8 washer	28mm aluminum standoff
8-32 blind nut (4)	Fuel tank
#64 rubber bands	Gas compatible fuel line
8-32 x 1 1/2-inch socket head cap screw	
Small cable ties	

Tools Required

Drill	1/8-inch hex wrench
3/16-inch drill bit	11/64-inch drill bit
13/64-inch drill bit	Ruler
Pencil	#1 Phillips screwdriver

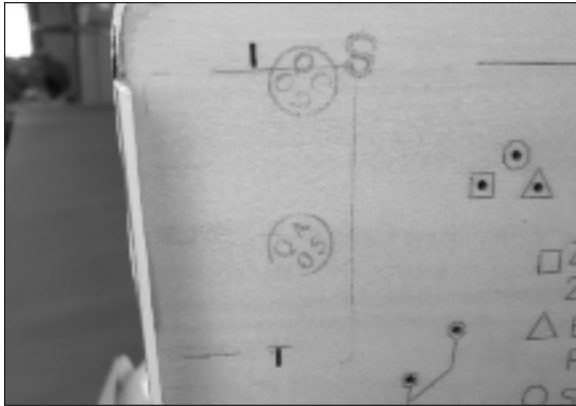
□ Step 1

Hold the ignition unit on the right side of the firewall with the top of the case approximately level with, and 1/8-inch in from the tab on the side of the fuselage. Use a pencil to mark the outline of the ignition unit on the firewall.



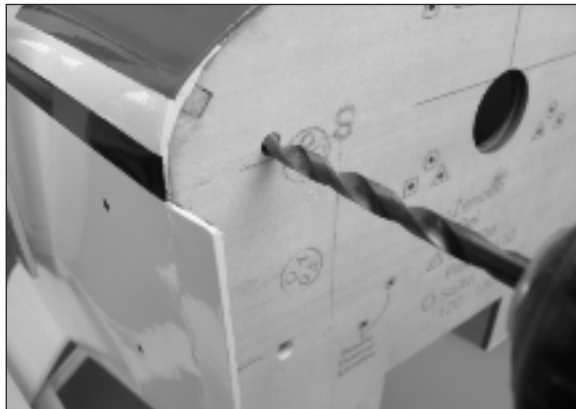
□ **Step 2**

On the upper line of the ignition measure 3/4-inch in from the right (as viewed looking at the firewall). Make a mark with a pencil. Measure 5/8-inch across on the lower line and make a mark in the same manner.



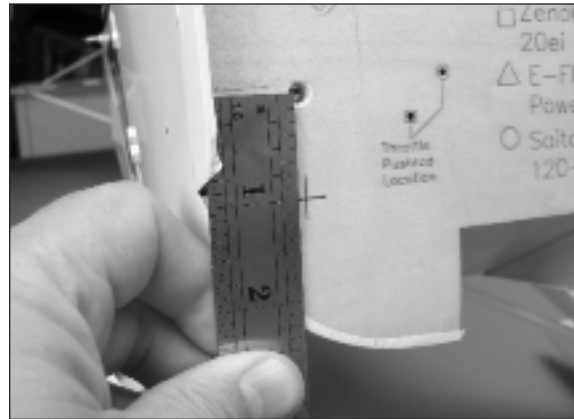
□ **Step 3**

Use a 3/16-inch drill bit to make a hole at each mark. Drill the holes so that they are located outside the outline of the ignition unit placement.



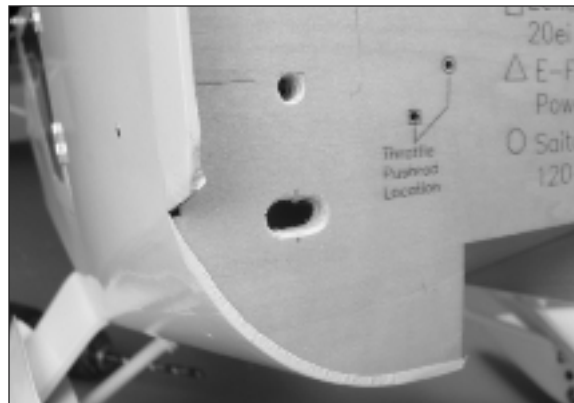
□ **Step 4**

Use a ruler to measure 1-inch below the lower hole drilled in Step 3 and mark the location with a pencil.



□ **Step 5**

Use a 1/4-inch drill bit to drill two holes next to each other. Clean out the extra wood between the holes with a hobby knife or file, forming a slot measuring 1/4 x 1/2-inches.



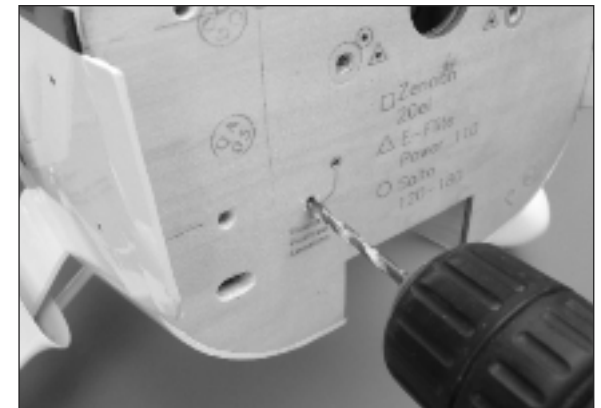
□ **Step 6**

Check that the battery lead from the ignition unit is able to pass through the slot into the fuselage.



□ **Step 7**

Use an 11/64-inch drill bit to enlarge the holes for the nylon pushrod tube housing.



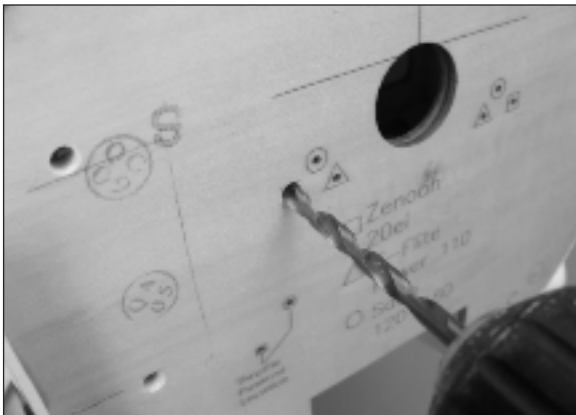
□ **Step 8**

Locate a 28mm aluminum standoff, 8-32 x 1 1/2-inch socket head cap screw, #8 washer and #8 blind nut. Place the washer and standoff on the cap screw.



□ **Step 9**

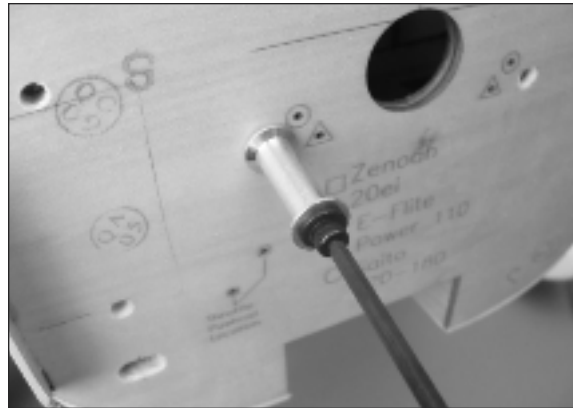
Use a 13/64-inch drill to enlarge the four engine mounting holes in the firewall for the blind nuts.



□ **Step 10**

Place an 8-32 blind nut into each engine mounting hole from the back side of the firewall. Use a 1/8-inch hex wrench to tighten the screw against the standoff and draw the blind nuts into the mounting holes.

Check the back of the firewall and make sure that the blind nut flanges are fully seated against the firewall.



□ **Step 11**

Use a #1 Phillips screwdriver to loosen the screw in the fuel tank stopper. Remove the stopper assembly from the fuel tank. Note the orientation of the vent line when removing the stopper assembly.



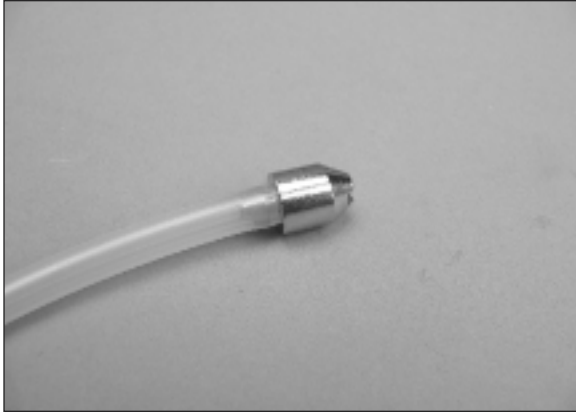
□ **Step 12**

Remove the clunk from the fuel line, and remove the line from the back of the stopper. Replace the fuel line with an equal length of gasoline compatible fuel tubing. Secure the tubing to the tube in the stopper with a small cable tie.



□ **Step 13**

Replace the clunk in the end of the fuel line.



□ **Step 14**

Insert the stopper assembly in the fuel tank, making sure that the vent line is oriented correctly. It should point towards the narrow side of the tank closest to the stopper.



□ **Step 15**

Insert the fuel tank under the instrument panel with the stopper towards the top of the tank.



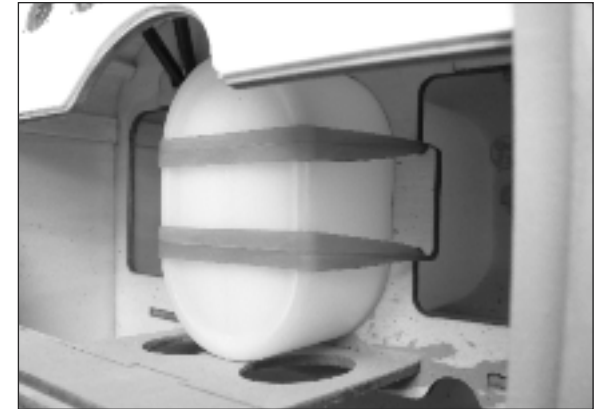
□ **Step 16**

Slide the tank forward until the stopper cap engages in the hole in the firewall.



□ **Step 17**

Use two #64 rubber bands to secure the tank in the fuselage. Hook the rubber bands around the tabs in the bulkhead on the left and right of the tank.



□ **Step 18**

Cut two lengths of fuel tubing, one 5-inches long, the other 8-inches. Connect the 5-inch piece to the tubing on the left side of the fuel tank stopper (feed line). Connect the 8-inch piece to the right side (vent line). Secure both fuel lines with small cable ties.



Ignition and Engine Installation

Parts Required

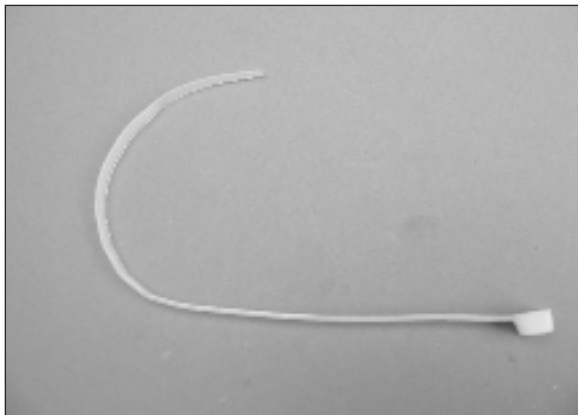
Fuselage	Engine (G20EI)
Ignition Unit	#8 washer (4)
Medium cable tie (2)	1/4-inch foam rubber
3mm x 10mm socket head cap screw	
8-32 x 1 1/2-inch socket head cap screws (4)	
28mm aluminum standoffs (4)	

Tools Required

1/8-inch hex wrench	3mm hex wrench
Threadlock	Sidecutters

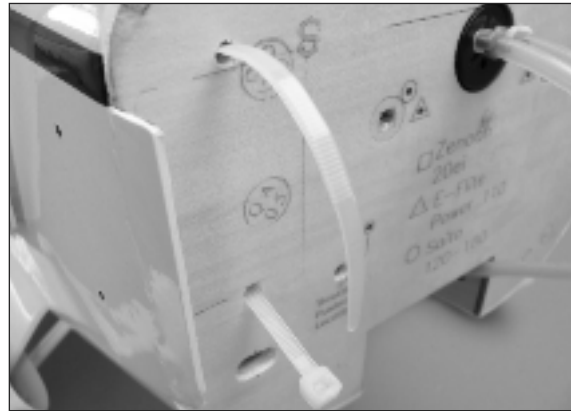
□ Step 1

Form a 180-degree curve in a medium cable tie.



□ Step 2

Insert the cable tie into the lower ignition mount hole and guide it out the upper hole.



□ Step 3

Cut a piece of 1/4-inch foam rubber the size of the ignition unit. Place the ignition unit and foam against the firewall and use a second cable connected to the first tie to secure it.



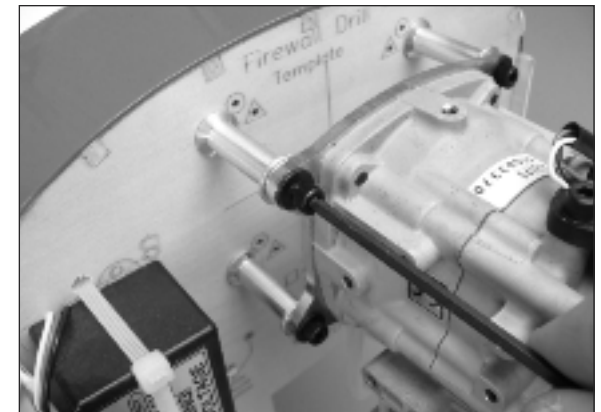
□ Step 5

Use a 3mm hex wrench to remove the carburetor isolator block from the engine.



□ Step 6

Apply a drop of threadlock to the end of each 8-32 x 1 1/2-inch socket head cap screws. Use a 1/8-inch hex wrench to mount the engine with the bolts, #8 washers and 28mm aluminum standoffs.



□ **Step 7**

Use a 3mm hex wrench to reinstall the carburetor isolator block.



□ **Step 8**

Attach the ground lead from the ignition unit to the top of the engine case with the 3mm x 10mm socket head cap screw and washer provided with the engine. Tighten with a 3mm hex wrench.



□ **Step 9**

Feed the ignition battery lead through the hole in the lower firewall. It will get connected at a later time.



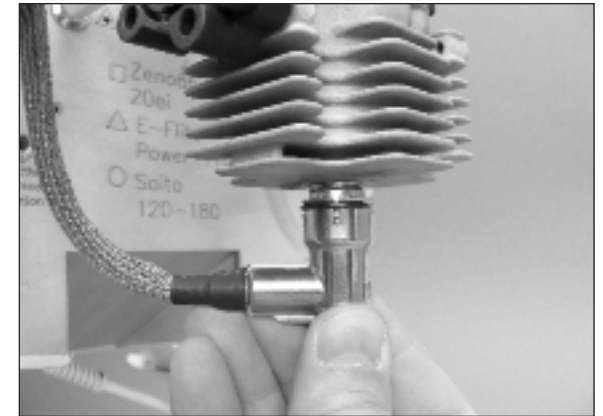
□ **Step 10**

Connect the signal lead from the ignition unit to the lead from the engine.



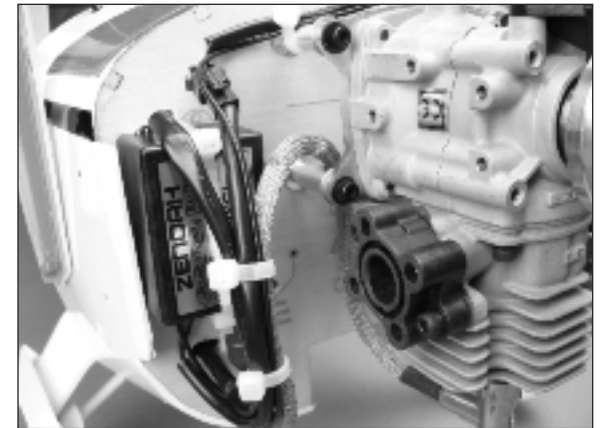
□ **Step 11**

Route the spark plug lead from the ignition unit over the lower right standoff behind the engine and connect the cap to the spark plug. The cap requires a firm push to make complete connection.



□ **Step 12**

Use cable ties as necessary to bundle the leads and arrange them neatly in the engine compartment.



Throttle Servo, Linkage and Carburetor Installation

Parts Required

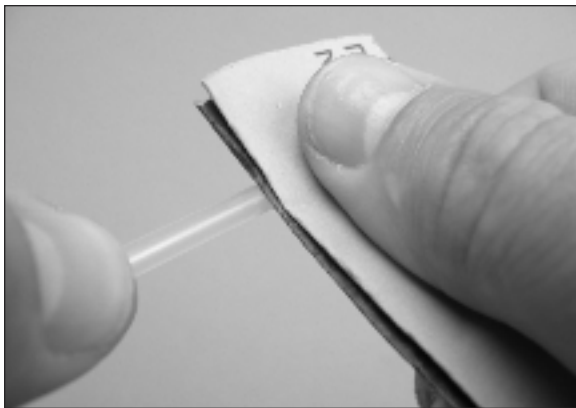
Fuselage	Nylon pushrod housing
Throttle servo	Throttle pushrod
Nylon snap link	2-56 ball link
Carburetor and hardware	

Tools Required

Medium CA	Medium grit sandpaper
Pliers	#1 Phillips screwdriver
Ruler	Hobby knife #11 blade
Felt-tipped pen	Threadlock
4mm hex wrench	Sidecutters
1.5mm hex wrench	3/16-inch wrench
Pin vise	9/64-inch drill bit

□ Step 1

Trim the nylon throttle pushrod housing to a length of 7 1/2-inches with a hobby knife. Use medium grit sandpaper to scuff 1-inch of one end.



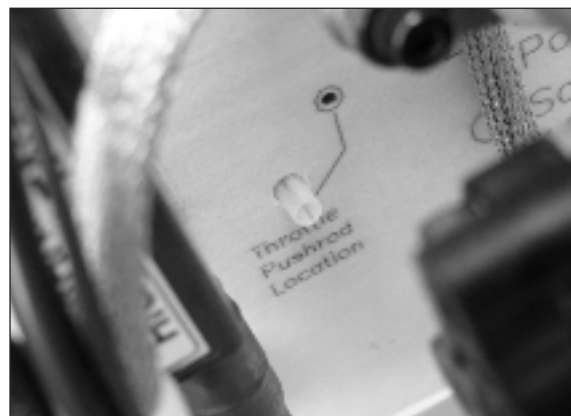
□ Step 2

Insert the housing into the pushrod hole in the firewall with the scuffed end forward. Guide it through the slot in the bulkhead at the front of the radio compartment.



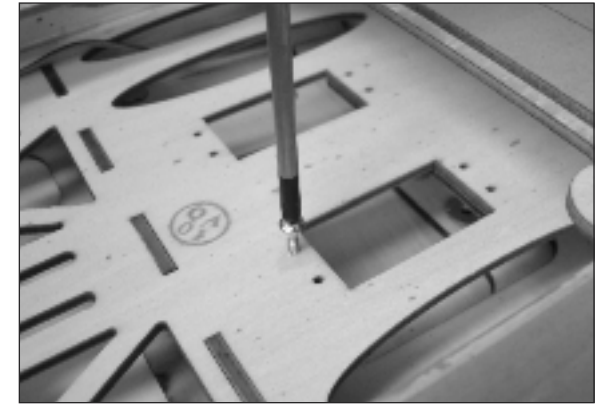
□ Step 3

Leave 1/4-inch of the housing protruding from the firewall and glue it in place with medium CA.



□ Step 4

Use a #1 Phillips screwdriver to install a servo screw in each of the throttle servo locations and form a thread.



□ Step 5

Remove the servo screws and apply 1–2 drops of thin CA to each hole to strengthen the wood. Do not use accelerator, the CA needs to penetrate completely.



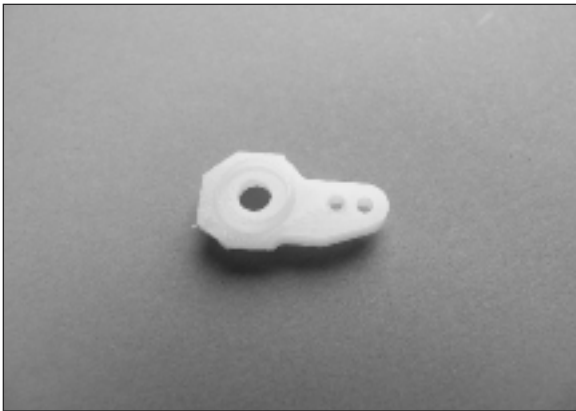
□ **Step 6**

Prepare the throttle servo in the same manner as the rudder and elevator servos (p.6 steps 2 & 3). Use a #1 Phillips screwdriver to install the servo with the output shaft towards the rear of the fuselage.



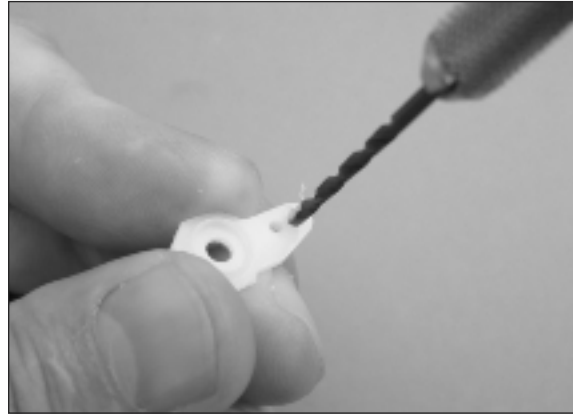
□ **Step 7**

Remove the servo arm from the servo and use sidecutters to remove three of the arms, leaving one short arm.



□ **Step 8**

Use a 9/64-inch drill bit in a pin vise to enlarge the outer hole of the remaining servo arm.



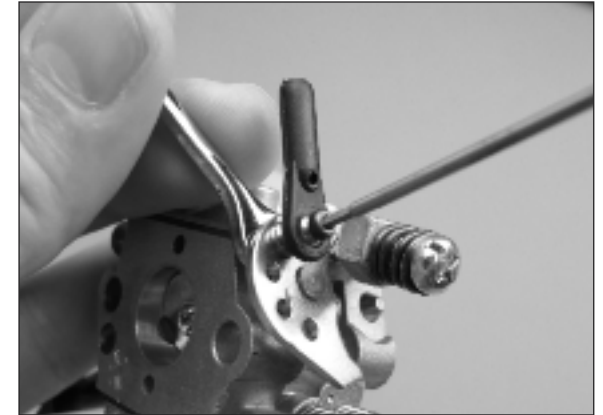
□ **Step 9**

Use your radio or a JR MatchMaker to center the throttle servo. Use a #1 Phillips screwdriver to install the servo arm.



□ **Step 10**

Place the 2-56 ball link in the throttle arm in the position shown and apply a drop of threadlock to the screw threads. Use a 1.5mm hex wrench and 3/16-inch wrench to install the 2-56 nut on the screw.



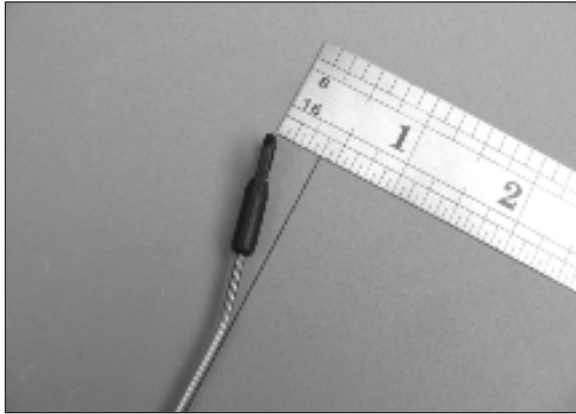
□ **Step 11**

Remove the connector from the ball link assembly on the throttle arm. Thread it onto the 11 3/4-inch 2-56 throttle pushrod until approximately 1/2-inch of thread remains exposed.



□ **Step 12**

Use pliers to form a bend in the throttle pushrod so that the end of the connector is offset 3/8-inch.



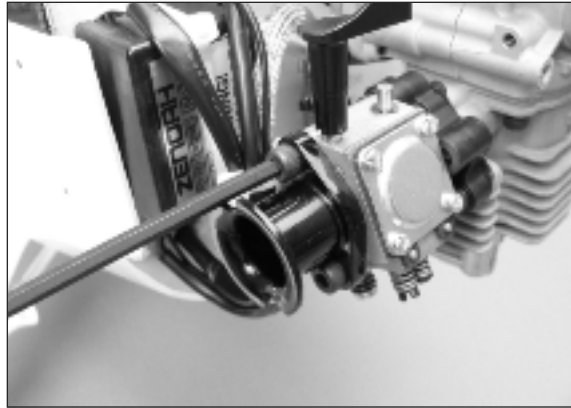
□ **Step 13**

Insert the throttle pushrod into the nylon pushrod housing in the firewall.



□ **Step 14**

Locate the carburetor intake funnel, gasket and the two 4mmx 40mm mounting bolts. Use a 4mm hex wrench to install the carburetor on the engine.



□ **Step 15**

Reattach the ball link connector to the throttle arm.



□ **Step 16**

The carburetor has a spring return that assists in returning the throttle to idle. Verify that the throttle is completely closed by pulling the pushrod rearwards. Use a felt-tipped pen to mark the position of the centered servo arm on the pushrod.



□ **Step 17**

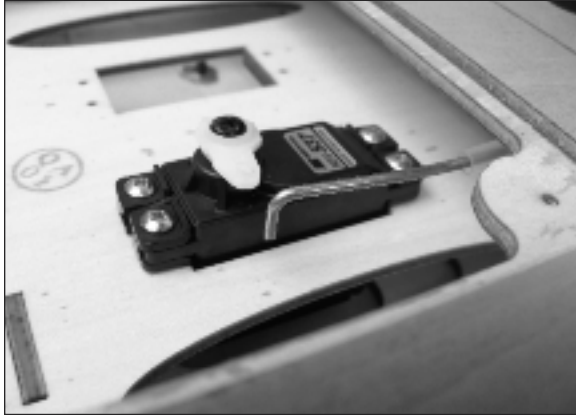
Use a felt-tipped pen to make a mark on the throttle pushrod 1/8-inch behind the first mark.



□ **Step 18**

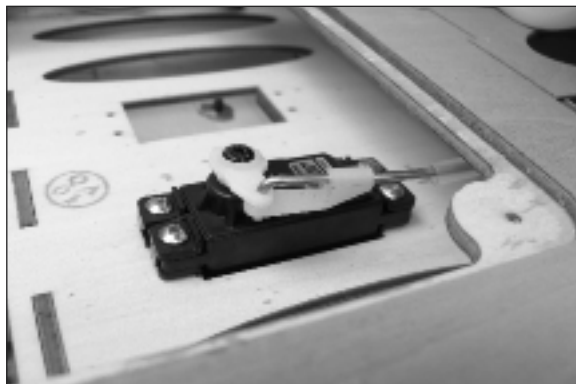
Use pliers to make a 90-degree downward bend in the pushrod at the mark made in Step 17. Trim the wire to a length of approximately 5/16-inch.

Note: You may find it easier to disconnect the pushrod from the carburetor and rotate it 180-degrees. This will allow the bend to be made in an upward direction.



□ **Step 19**

Operate the throttle pushrod by hand and make any slight bends or adjustments necessary for it to operate smoothly without binding. Connect the pushrod to the throttle servo and secure it with a snap keeper.



Cowling Installation

Parts Required

Fuselage	Cowling
Muffler	Manila card stock
#4 washers (4)	
4mm x 50mm socket head cap screws (2)	
4-40 x 1/2-inch socket head cap screws (4)	

Tools Required

Rotary tool	5/64-inch hex wrench
Pencil	Felt-tipped pen
Ruler	Scissors
4mm hex wrench	Hobby knife with #11 blade

Three openings are required in the cowling to clear the spark plug cap, intake funnel and exhaust.

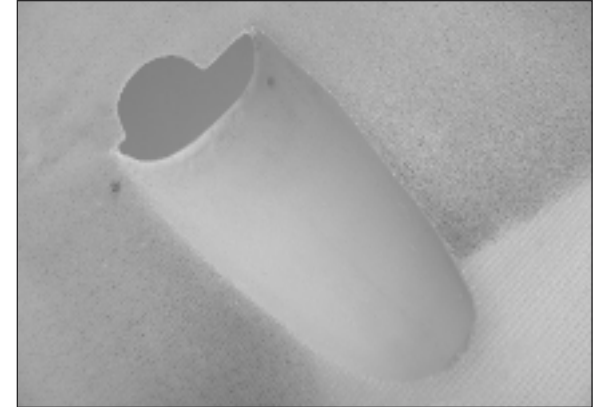
□ **Step 1**

Use a rotary tool fitted with a sanding drum to make an opening in the lower surface of the cowl in front of the scoop. The opening will measure approximately 7/8-inch wide, 1/2-inch long and is offset to the left.



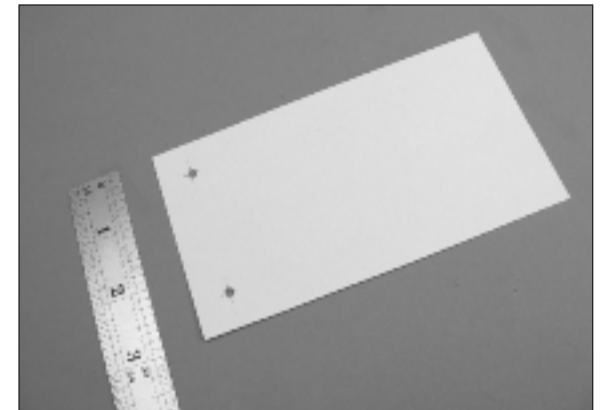
□ **Step 2**

On the inside of the cowling, use a hobby knife to remove the entire section of fiberglass that bridges the bottom scoop. This is required for cooling airflow on each powerplant installation type.



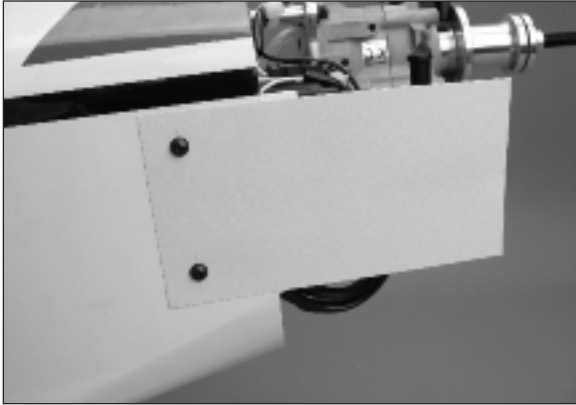
□ **Step 3**

Cut a 3 x 5 1/2-inch template from manila card stock. Approximately 1/2-inch from one end make two holes 1 15/16 (50mm) apart.



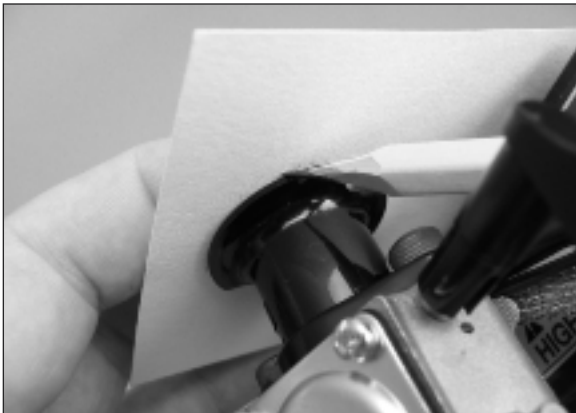
□ **Step 4**

Use a 5/64-inch hex wrench to attach the template to the right side of the fuselage with two of the 4-40 x 1/2-inch button head cowl mounting screws.



□ **Step 5**

Use a pencil to mark the location of the intake funnel on the back side of the template.



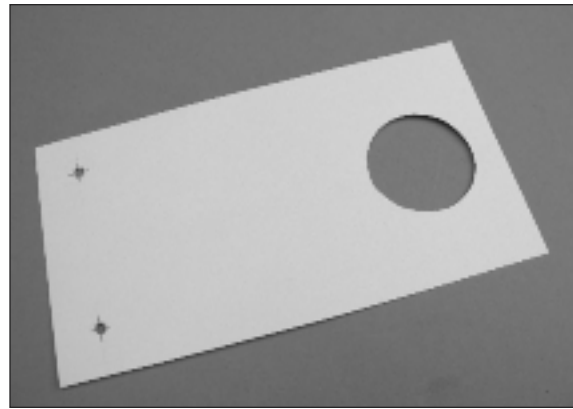
□ **Step 6**

Remove the template and air funnel. Use the funnel to complete marking the circle on the template.



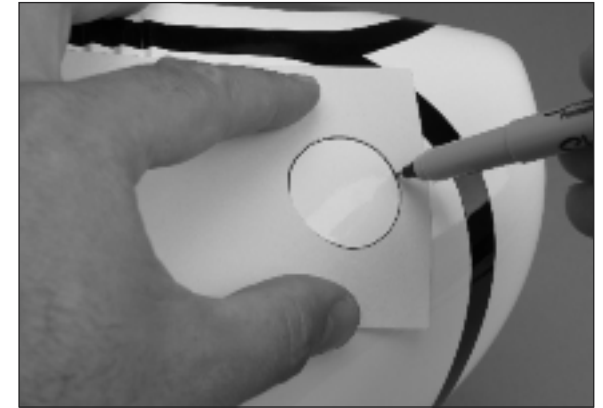
□ **Step 7**

Use a hobby knife with #11 blade to cut out the marked section of the template. Use a pencil to mark which is the inside of the template so that it can't be installed incorrectly.



□ **Step 8**

Align the screw holes in the template over the mounting holes on the right side of the cowling and tape it in place with low-tack tape. Use a felt-tipped pen to mark the location of the cutout for the intake funnel.



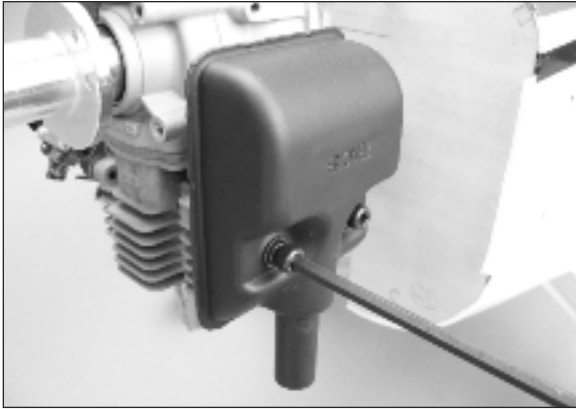
□ **Step 9**

Use a drum sander in a rotary tool to make the opening in the cowling for the inlet funnel.



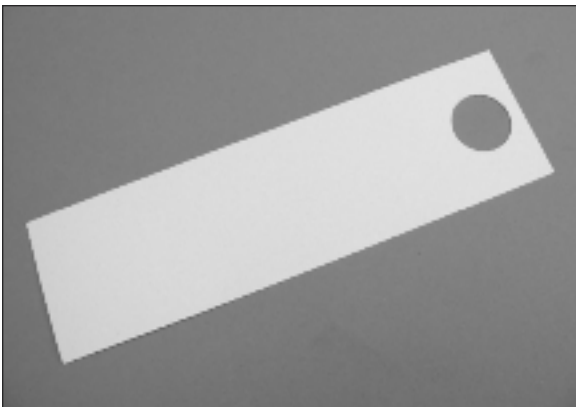
□ **Step 10**

Use a 4mm hex wrench to install the muffler and gasket with the 4mm x 50mm socket head cap screws supplied with the engine.



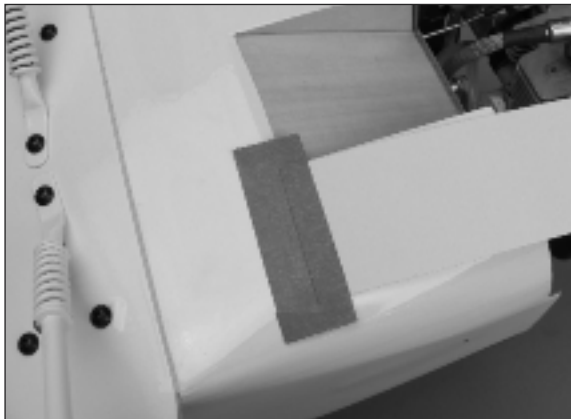
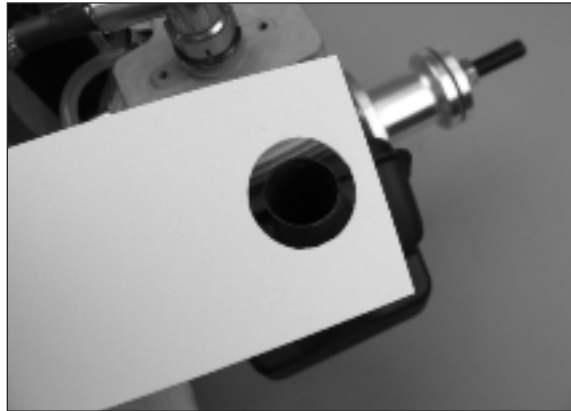
□ **Step 11**

Cut a manila card stock template measuring 2-inches x 7-inches. Make a 3/4-inch diameter hole spaced approximately 1/4-inch from one end.



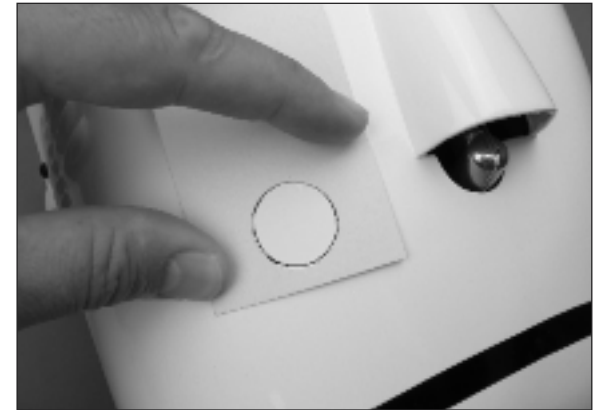
□ **Step 12**

Place the fuselage inverted on the work table. Align the exhaust template so that it is centered over the exhaust and tape it in place on the fuselage with low-tack tape.



□ **Step 13**

Remove the muffler then use a 5/64-inch hex wrench to install the cowling with four 4-40 x 1/2-inch button head machine screws. Make sure that the cowling is installed under the exhaust cutout template. Use a felt-tipped pen to mark the location of the exhaust cutout on the cowling.

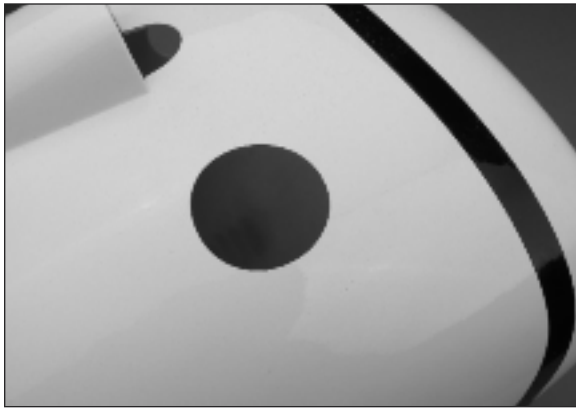


Note: Because the cowling does not fit flush with the bottom of the fuselage, the exhaust template will move a small amount when placed on the cowl. Offsetting the template 3/16-inch forward and outboard before marking the cowling will give a more accurate cutout location.



□ **Step 14**

Remove the cowling and use a sanding drum in a rotary tool to make the opening for the exhaust.



□ **Step 15**

Remove the propeller nut and washer and set them aside. Apply threadlock to the muffler bolts and install the muffler. Install the cowling and check the cutouts for clearance with the plug cap, intake funnel and exhaust. Make any necessary adjustments so that the engine does not contact the cowling.



Fuel System Connections

Required Parts

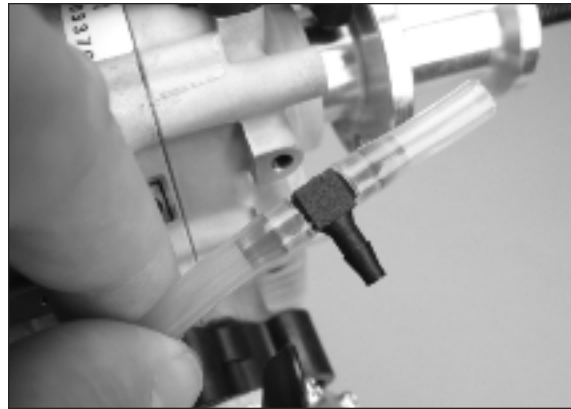
Fuselage	Cowling
Fuel dot	Fuel tubing
Small cable tie	

Required Tools

Ruler	Tapered reamer
Felt-tipped pen	Sidecutters

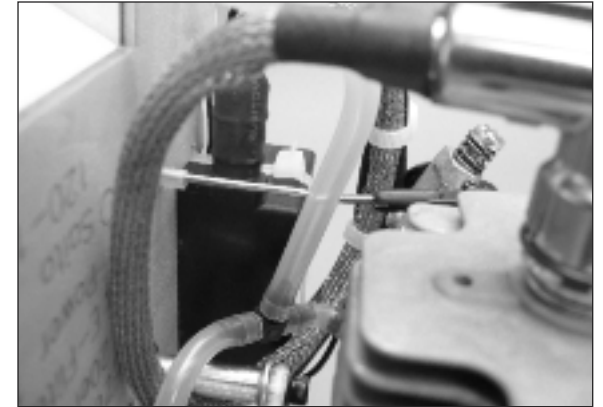
□ **Step 1**

Remove the cowling. Use sidecutters to remove an approximately 1 1/2-inch length from the end of the fuel feed line and insert a tee fitting.



□ **Step 2**

Connect the fuel feed line to the carburetor inlet. Attach an 8-inch length of fuel tubing to the open leg of the fuel tee, this will become the fuel fill line.



□ **Step 3**

Attach a small cable tie 3/8-inch from the end of the vent line. Insert the fuel dot plug into the feed line. Place both lines in the cooling exit ramp on the fuselage bottom temporarily.



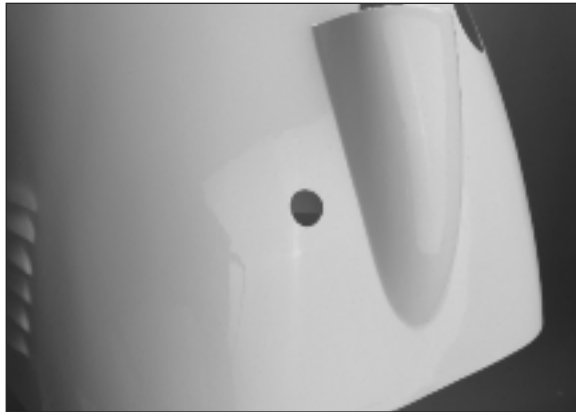
Step 4

Measure 2 1/2-inch forward and 5/8-inch out from the side of the scoop on the lower right side of the cowl. Make a mark with a felt-tipped pen.



Step 5

Use a tapered reamer to make a 3/8-inch diameter hole for the body of the fuel dot fitting.



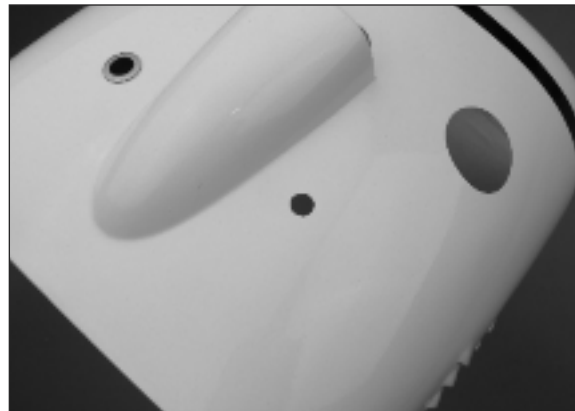
Step 6

Install the body of the fuel dot fitting in the cowl. Use a small amount of threadlock on the threads to prevent the fitting vibrating loose.



Step 7

Mark a similar location on the lower cowl on the opposite side of the scoop. Use a tapered reamer to make a suitably sized hole for the vent line from the fuel tank.



Aileron Servo Installation

Parts Required

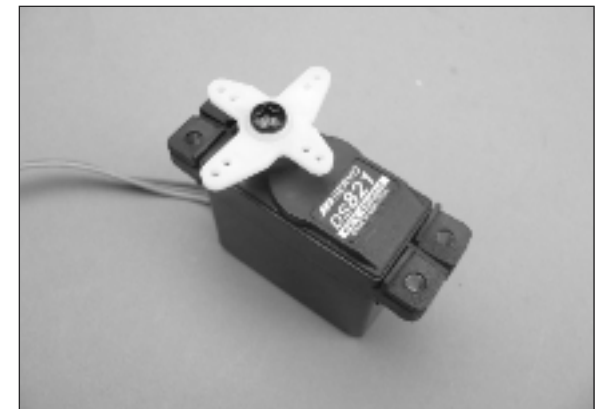
Wing panels	Aileron servos
4-40 clevis (4)	4-40 hex nut (4)
Aileron pushrods (2)	12-inch servo extension (2)
#2 x 1/4-inch self-tapping screws (8)	
20 x 20 x 10mm hardwood block (2)	

Tools Required

Pencil	#1 Phillips screwdriver
12-minute epoxy	Mixing sticks
Mixing cups	Thin CA
Threadlock	3/16-inch wrench
Pin vise	1/16-inch drill bit
Low-tack tape	

Step 1

Prepare the aileron servo by installing grommets and bushings as in steps 2 & 3 on page 6.



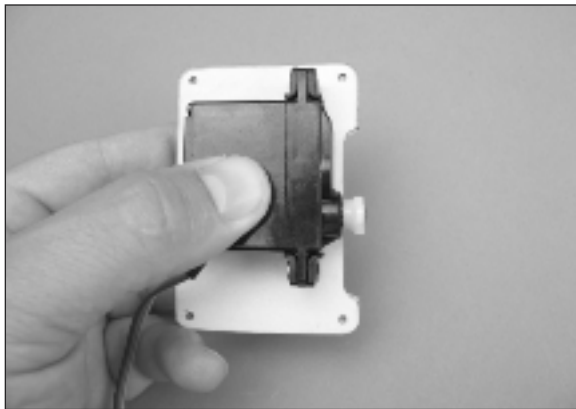
□□ **Step 2**

Use your radio to center the servo then use a #1 Phillips screwdriver to remove the stock arm from the servo. Install the 180-degree arm supplied in the servo hardware pack.



□□ **Step 3**

Remove the aileron hatch from the wing and place the servo on the inside of the hatch. Align the servo arm with the edge of the hatch.



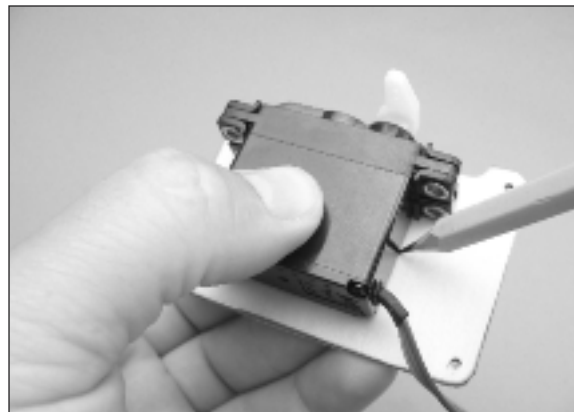
□□ **Step 4**

Center the servo arm within the length of the opening.



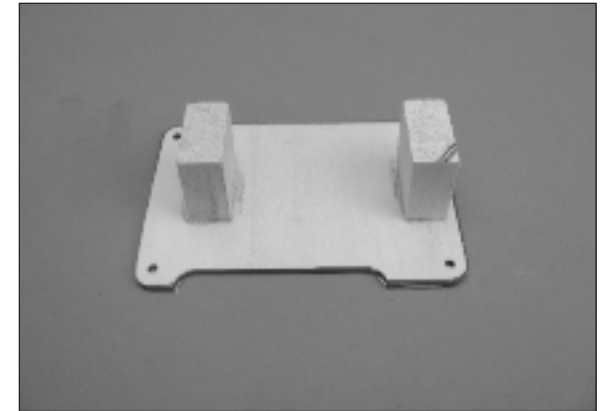
□□ **Step 5**

Use a pencil to mark the servo location on the inside of the hatch.

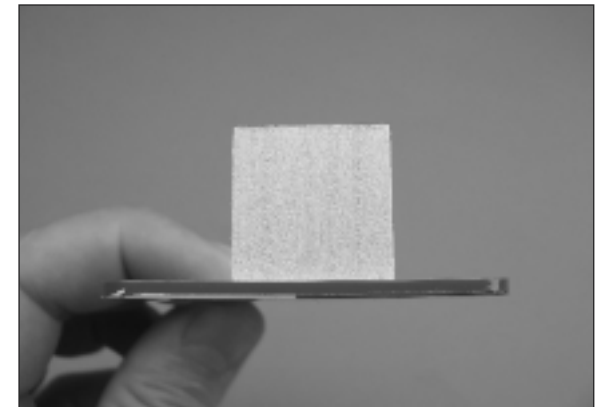


□□ **Step 6**

Mix a small amount of 12-minute epoxy and glue the 20 x 20 x 10mm servo mounting blocks to the hatch on the outside of the markings for the servo.

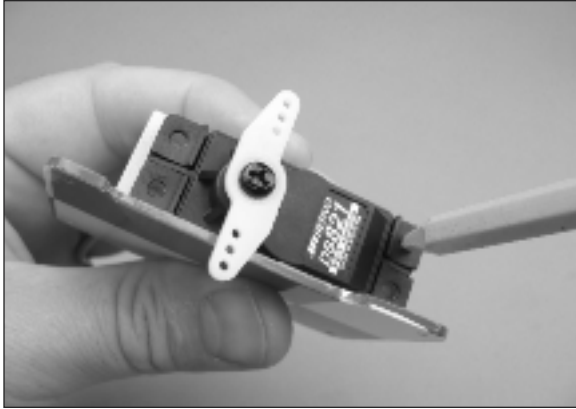


Note that the grain of the mounting blocks runs perpendicular to the hatch surface.



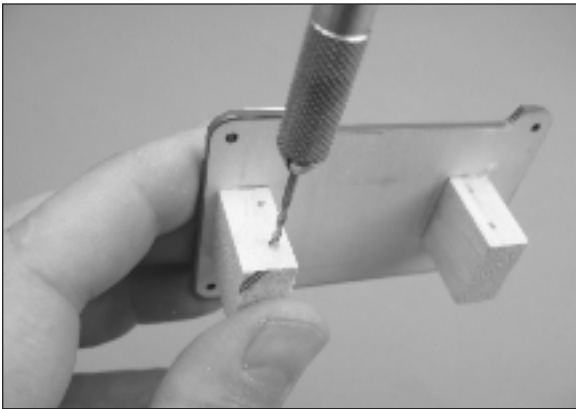
□□ **Step 7**

Place the servo on the mounting blocks, leaving a 1/16-inch gap between the servo and the hatch surface. Use a pencil to mark the servo mounting locations on the blocks.



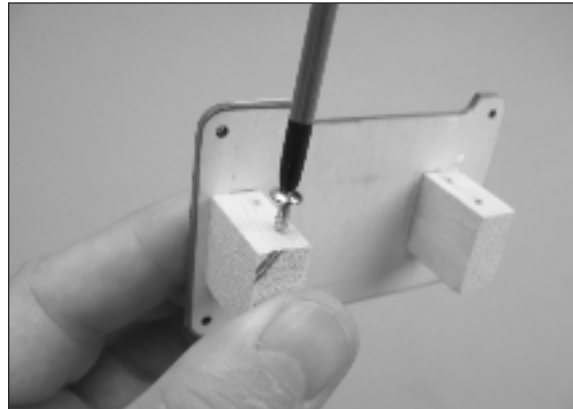
□□ **Step 8**

Use a 1/16-inch drill bit in a pin vise to drill the servo mounting holes.



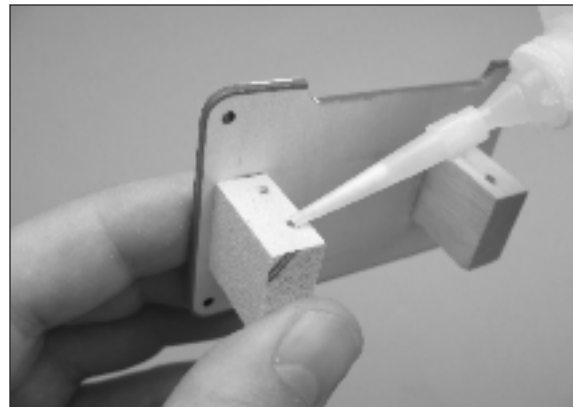
□□ **Step 9**

Use a #1 Phillips screwdriver to thread a servo mounting screw into each of the mounting holes.



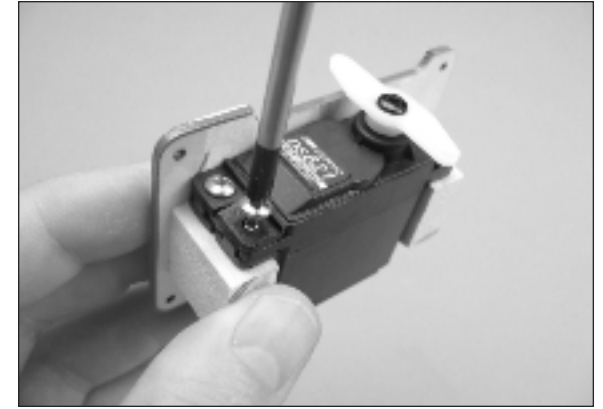
□□ **Step 10**

Remove the screws and apply 1–2 drops of thin CA to each of the mounting holes to strengthen the wood.



□□ **Step 11**

Use a #1 Phillips screwdriver to install the servo to the hatch with four servo mounting screws.



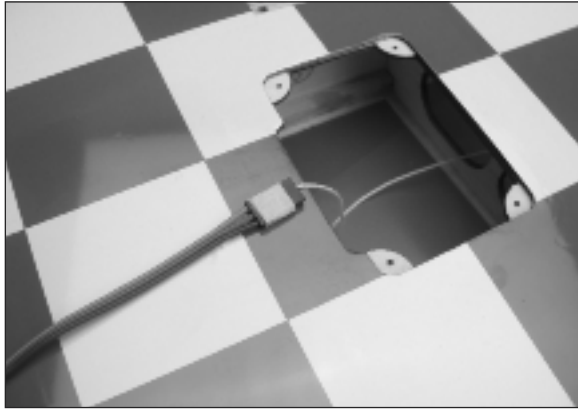
□□ **Step 12**

Attach a 12-inch servo extension lead to the aileron servo and secure it with a length of dental floss. Apply a very small drop of thin CA to the knot to prevent it working loose.



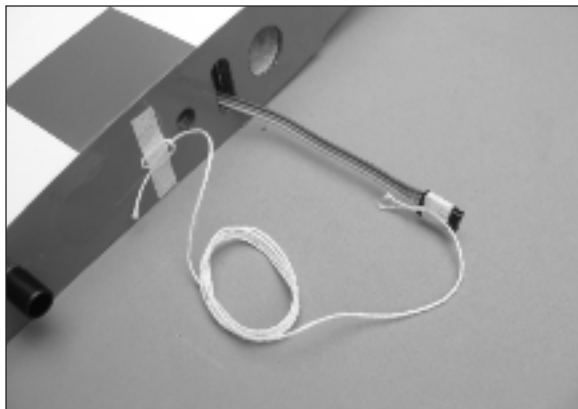
□□ **Step 13**

There is a string provided to pull the aileron servo lead through the wing. Remove the string from the wing surface and tape it to the servo lead.



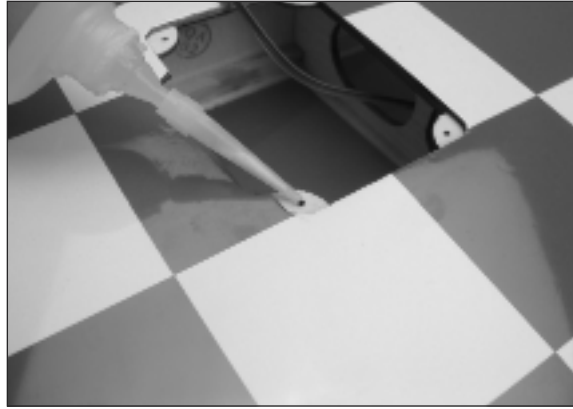
□□ **Step 14**

Pull the aileron lead through the wing then remove the tape and string.



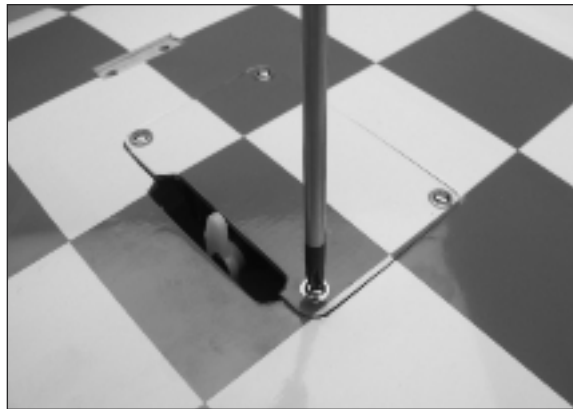
□□ **Step 15**

Apply a drop or two of thin CA to each of the pre-drilled servo mounting holes in the wing panel.



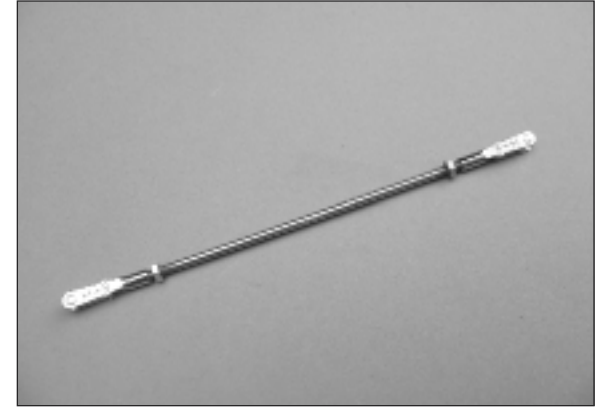
□□ **Step 16**

Use a #1 Phillips screwdriver to install the aileron hatch in the wing panel with four #4 x 1/4-inch self-tapping screws.



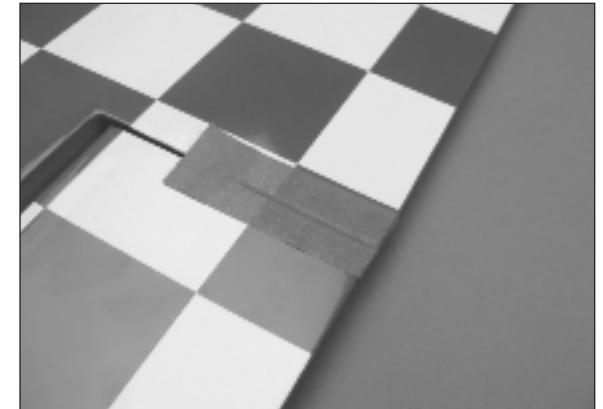
□□ **Step 17**

Place a 4-40 hex nut and 4-40 clevis on each end of a 4 5/16-inch aileron pushrod.



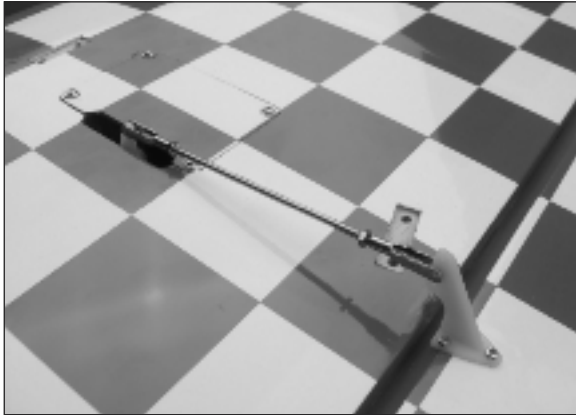
□□ **Step 18**

Use a piece of low-tack tape to hold the aileron in the neutral position. Wrap the tape around the trailing edge and onto the top surface so the aileron can't move.



□□ **Step 19**

Make sure that the aileron servo is centered, and adjust the pushrod to length. Attach one clevis to the outer servo arm hole, the other to the middle hole on the aileron control horn.



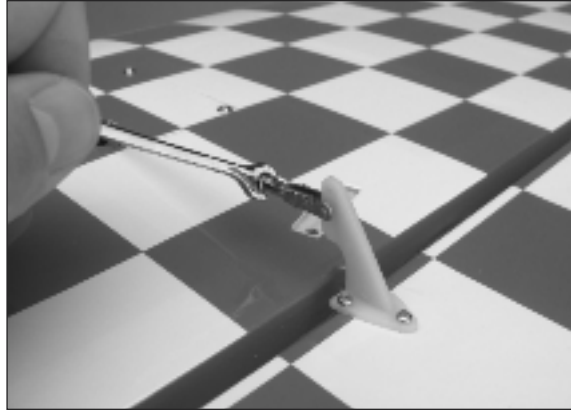
□□ **Step 20**

Place a drop of threadlock at the end of each clevis.



□□ **Step 21**

Use a 3/16-inch open-ended wrench to tighten each 4-40 hex nut against the clevis.



□ **Step 22**

Repeat steps 1 through 21 to install the aileron servo and linkage in the opposite wing panel.

Wing Strut Assembly

Parts Required

Wing panels	Wing Strut (4)
Jury strut (6)	Strut fitting (wing) (4)
#4 washer (4)	Strut fitting (fuselage) (2)
5mm hex nut (4)	4-40 nylon lock nut (8)
Strut end (4)	Jury strut fitting (4)
#6 washer (4)	
4-40 x 3/8-inch button head machine screw (8)	
4-40 x 1/2-inch button head machine screw (4)	
4-40 x 5/8-inch socket head cap screw (8)	
6-32 x 1/2-inch button head machine screw (4)	

Tools Required

Threadlock	3/32-inch hex wrench
1/4-inch wrench	5/64-inch hex wrench

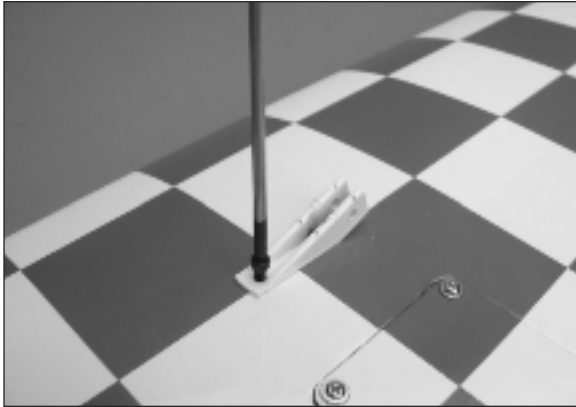
□□ **Step 1**

Apply a drop of threadlock to the end of a 4-40 x 5/8-inch socket head cap screw.



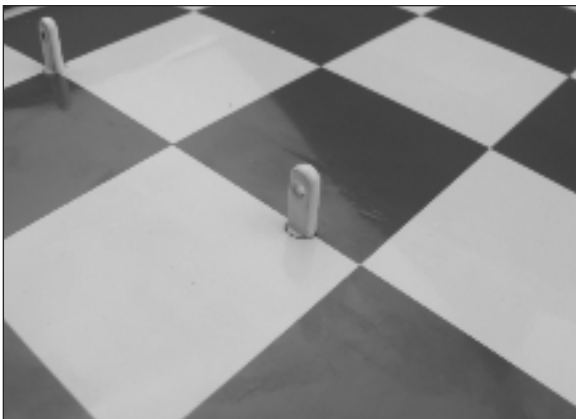
□□ **Step 2**

Place the strut attach brackets into the openings in the lower wing surface and use a 3/32-inch hex wrench to secure each one with two 4-40 x 5/8-inch socket head cap screws.



□□ **Step 3**

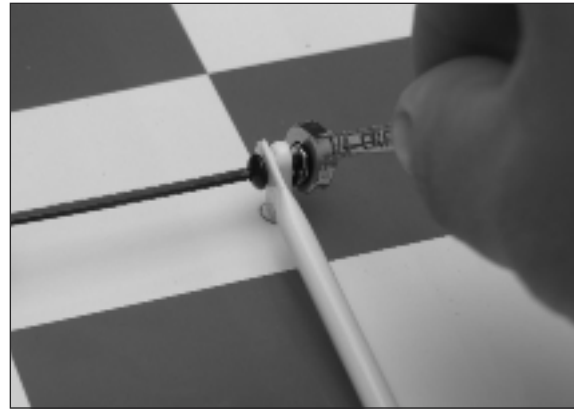
Thread the jury strut attach fittings into the lower wing surface until the shoulder of the fitting is flush with the wing surface. The flat sides of the fitting will be oriented forward and aft.



□□ **Step 4**

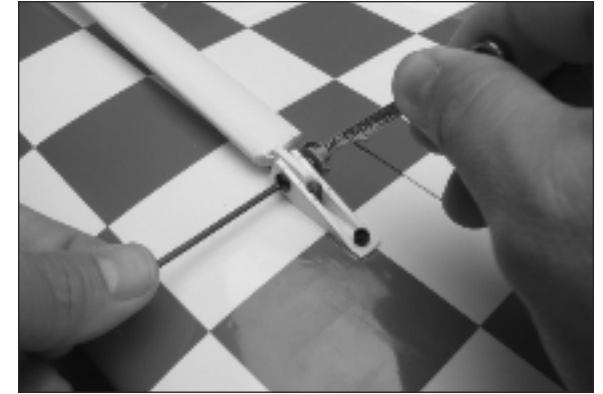
Attach a jury strut to the outboard side of each of the attached fittings with a 4-40 x 3/8-inch button head machine screw, #4 washer and 4-40 nylon lock nut. Tighten the strut to the fitting with a 5/64-inch hex wrench and 1/4-inch open-ended wrench.

Note: All the jury struts are the same.



□□ **Step 5**

Locate the wing struts. Each of the four struts is different, the forward strut measures 20 1/2-inches long, the rear 21 1/8-inches and the attach bracket on the strut faces the wing surface. Use a 5/64-inch hex wrench and 1/4-inch wrench to attach the struts to the strut fittings with a 4-40 x 1/2-inch button head machine screw and 4-40 nylon locknut.



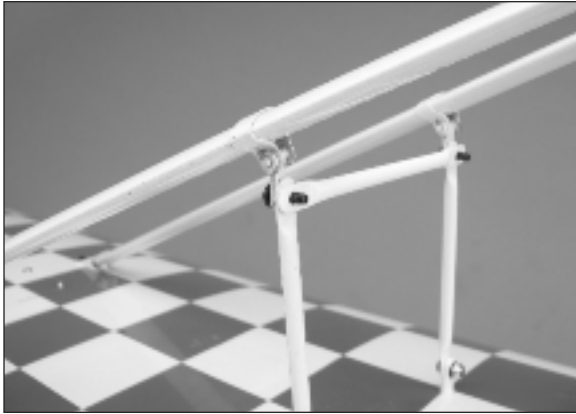
□□ **Step 6**

Use a 4-40 x 3/8-inch button head machine screw to connect each jury strut to the attachment bracket on the wing strut.



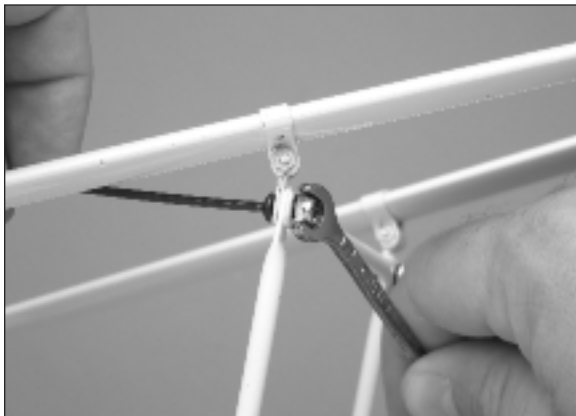
□□ **Step 7**

Slide a third jury strut onto the screws to serve as a spreader bar between the wing struts.



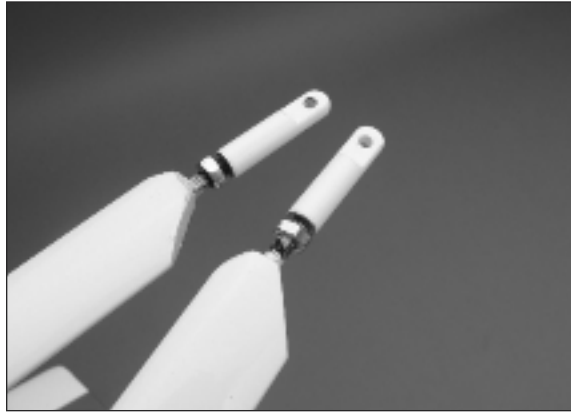
□□ **Step 8**

Place a #4 washer on the screw and thread on a #4 nylon locknut. Use a 5/64-inch hex wrench and 1/4-inch open-end wrench to secure the struts.



□□ **Step 9**

Thread a 5mm hex nut and strut end onto the end of the wing struts.



□□ **Step 10**

Slide a #6 washer onto a 6-32 x 1/2-inch button head machine screw.



□□ **Step 11**

Use a 3/32-inch hex wrench to attach the strut fitting to the fuselage bottom with the two 6-32 x 1/2-inch machine screws.



□ **Step 12**

Repeat steps 1 through 11 to complete the strut assembly for the opposite wing panel.

Radio Installation

Parts Required

Fuselage	Deluxe chargeswitch
Receiver	12-inch extension lead (2)
Receiver battery	Cable ties (small)

Tools Required

Hook and loop strap	#0 Phillips screwdriver
Scissors	Double-sided adhesive tape
Thin CA	Dental floss

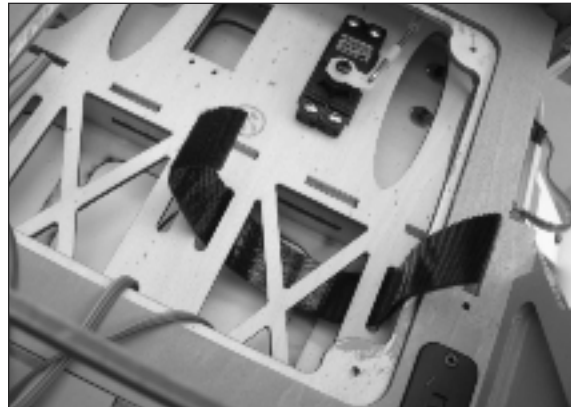
□ Step 1

Use a #0 Phillips screwdriver to install a chargeswitch in the pre-cut location on the left hand fuselage floor. Use the self-tapping screws provided with the switch.



□ Step 2

Use scissors to cut an 8-inch length of hook and loop strap and loop it through the slots on the right hand side of the radio compartment.



□ Step 3

Attach the receiver battery to the radio compartment floor with double-sided tape then fasten the hook and loop tape over the battery.



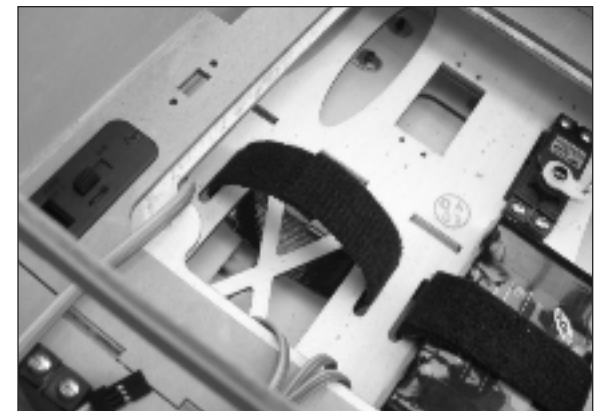
□ Step 4

Connect the battery lead to the chargeswitch and secure the connection with dental floss. Apply a small amount of thin CA to the knot so that it doesn't become loose.



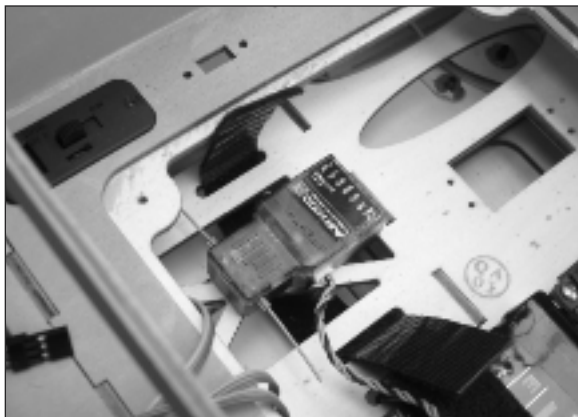
□ Step 5

Use scissors to cut a 7-inch length of hook and loop strap and loop it through the slots on the left hand side of the radio compartment.



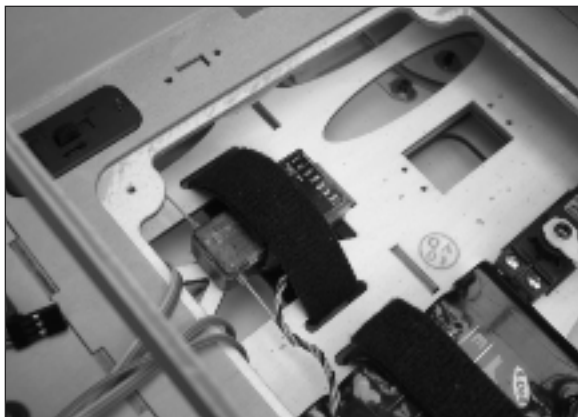
□ **Step 6**

Attach the receiver to radio compartment floor with double-sided adhesive tape.



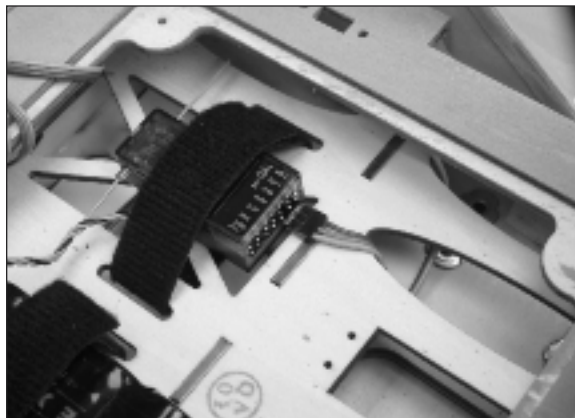
□ **Step 7**

Fasten the hook and loop tape over the receiver.



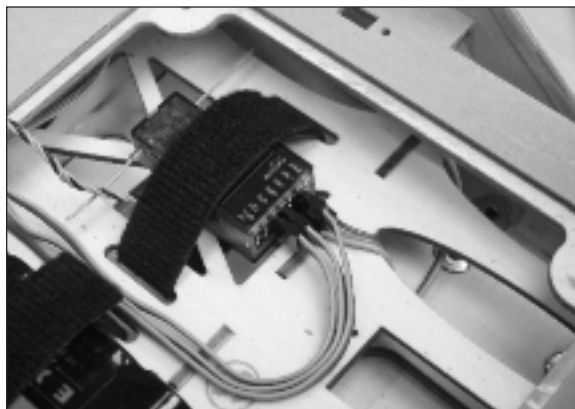
□ **Step 8**

Connect the power lead from the chargeswitch to the receiver battery port.



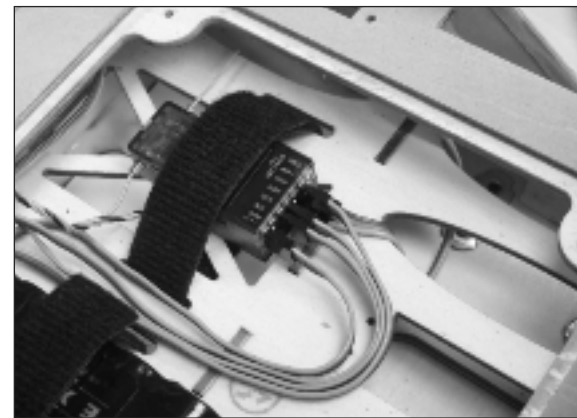
□ **Step 9**

Plug the rudder and two elevator servo leads into the receiver.



□ **Step 10**

Plug the throttle servo lead into the receiver.



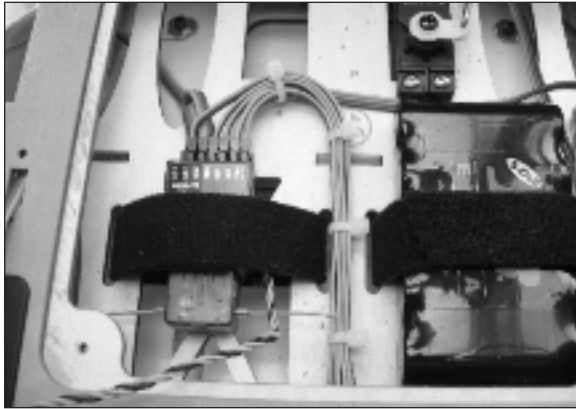
□ **Step 11**

Plug two 12-inch servo extension leads into the receiver for the ailerons. Route the leads to each side of the fuselage and up through the unused switch port.



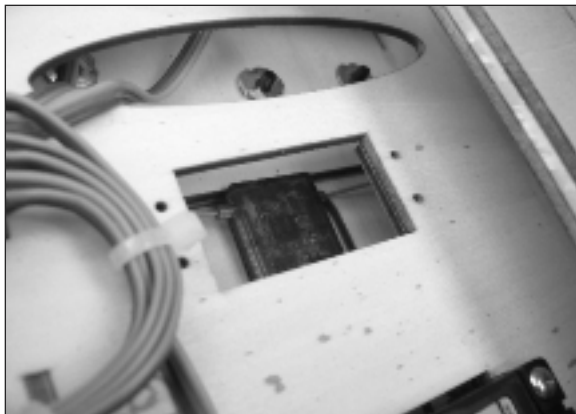
□ **Step 12**

Use small cable ties to organize the servo leads in the radio compartment.



□ **Step 13**

Use double-sided foam tape to install the remote receiver under the radio compartment floor. It is preferable to orient the remote receiver perpendicular to the main receiver. If you are using a glow engine the remote receiver can be mounted on the radio compartment floor.



Ignition Battery Installation Required for Gas Engine

Parts Required

Fuselage Chargeswitch
Ignition battery

Tools Required

Dental floss #0 Phillips screwdriver
Double-sided adhesive tape

□ **Step 1**

Install a chargeswitch in the cutout on the right hand side of the radio compartment. Use a #0 Phillips screwdriver and the self-tapping screws provided with the switch.



□ **Step 2**

Feed the male lead from the switch forward under the cockpit floor through the same slot as the nylon pushrod housing for the throttle pushrod.



□ **Step 3**

Connect the male lead from the switch to the battery lead of the ignition unit.



□ **Step 4**

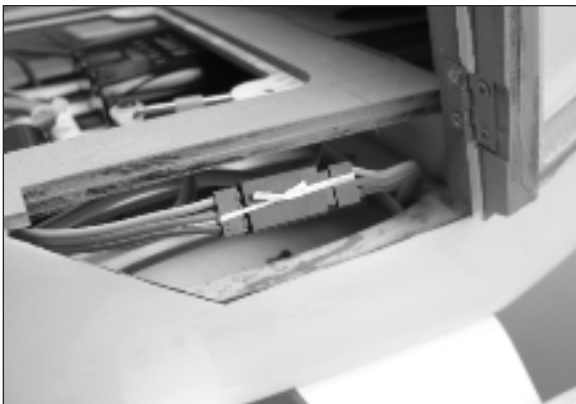
Use double-sided adhesive tape to attach the ignition battery to the front of the radio compartment tray.

Note: If needed for balance, the ignition battery may be mounted forward of the radio compartment on the left side of the fuel tank.



□ **Step 5**

Connect the power lead from the battery to the switch and secure the connector with dental floss. Apply a small amount of thin CA to the knot to prevent it coming loose.



Windshield, Landing Gear Cuff and Cowl Baffle Installation

Parts Required

Fuselage	Windshield
Cowl Baffles (2)	

Tools Required

Low-tack tape	Canopy glue
Ruler	

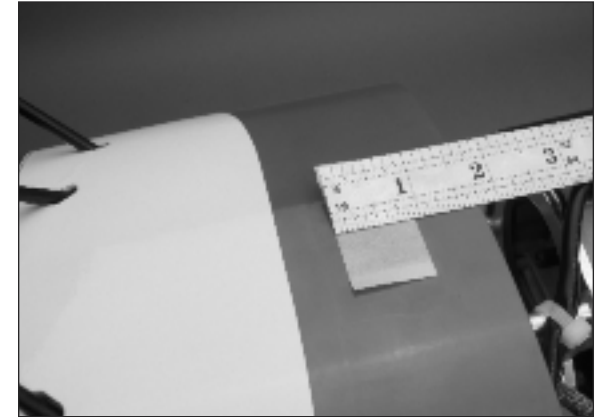
□ **Step 1**

Slide the landing gear cuff up the gear leg against the fuselage. Apply a small bead of canopy glue around the intersection of the gear leg and the cuff. Tape the cuff to the fuselage with low-tack tape if necessary to hold it in position. Gluing the cuff to the gear leg only will allow the landing gear to be removed in the future if required.



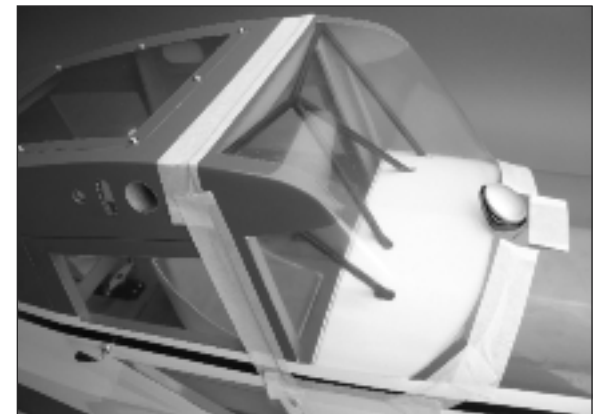
□ **Step 2**

Measure 1 3/4-inches behind the firewall and place a piece of low-tack tape as a marker. This represents the rear edge of the cowl when mounted; the windshield can be positioned no further forward than this point.



□ **Step 3**

Apply a bead of canopy glue around the inside of the windshield and set it in place on the fuselage. Use low-tack tape to hold the windshield in position while the glue cures. Allow time for the glue to dry completely.



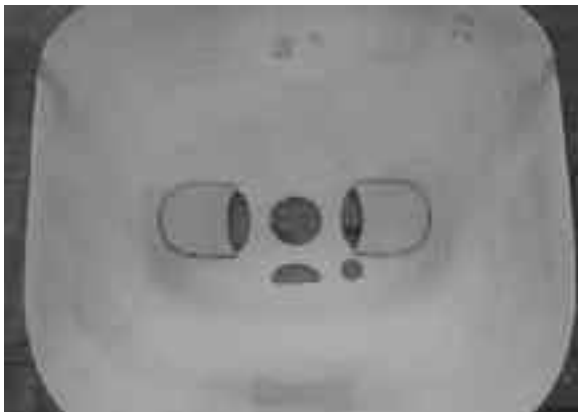
□ **Step 4**

Maintain approximately a 3/32-inch (2.5mm) gap between the tape marker and the front of the windshield to ensure that when the cowl is installed it does not contact the windshield.



□ **Step 5**

Use canopy glue to install the cowl baffles on the inside of the cowl inlets. Place the cowl nose down on a flat surface and allow the glue to cure fully.



Final Assembly

Parts Required

Fuselage	Wing panels
Radio cover	Top window
Seat	Wing tube
Strut pin (4)	Keeper (4)
Pilot figure	Propeller
Cowling	Cable tie (small)
#4 washer (4)	Silicone pin spacer (4)
4-40 x 1/2-inch button head machine screw (4)	
#4 x 1/4-inch self-tapping screw (12)	
1/4-20 x 1 1/2-inch nylon wing bolt (2)	

Tools Required

Thin CA	#1 Phillips screwdriver
Threadlock	9/32-inch open-end wrench
5/64-inch hex wrench	

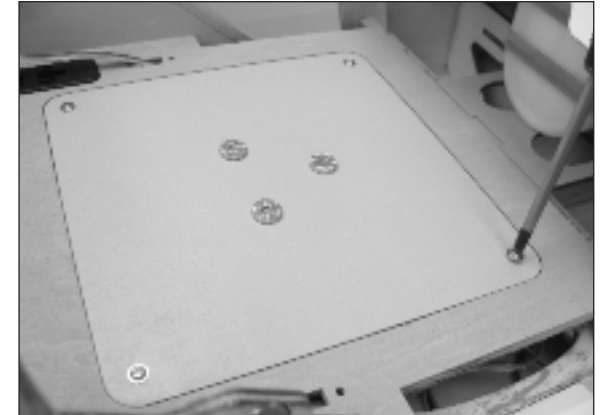
□ **Step 1**

Apply 1–2 drops of thin CA to each of the radio cover mounting holes.



□ **Step 2**

Use a #1 Phillips screwdriver to install the radio cover with four #4 x 1/4-inch self-tapping screws. Note the orientation of the magnets on the cover; the single magnet goes to the front of the fuselage.



□ **Step 3**

Place the seat in position on the radio cover.



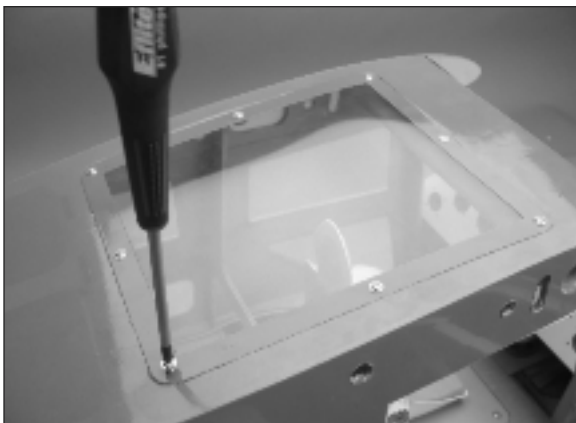
Step 4

Apply a drop of thin CA to each of the 8 mounting holes for the top window. Do not use accelerator, allow the glue to penetrate the wood completely.



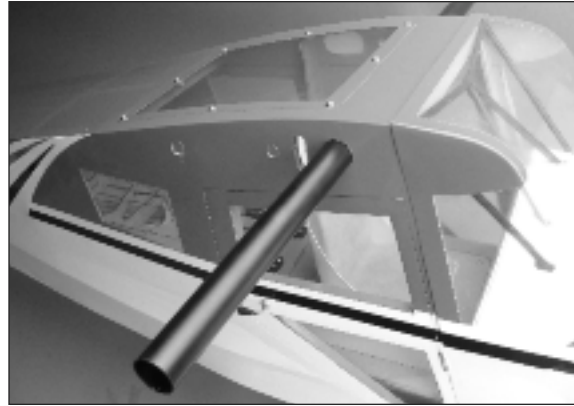
Step 5

Use a #1 Phillips screwdriver to install the top window with eight #4 x 1/4-inch self-tapping screws. The window is shaped such that it will only fit one way.



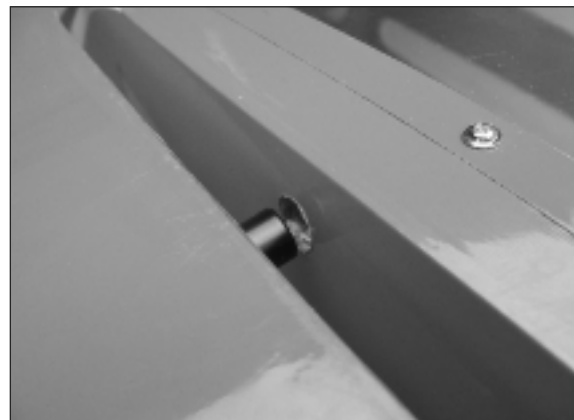
Step 6

Slide the 21 3/4 x 3/4-inch aluminum wing tube into the fuselage.



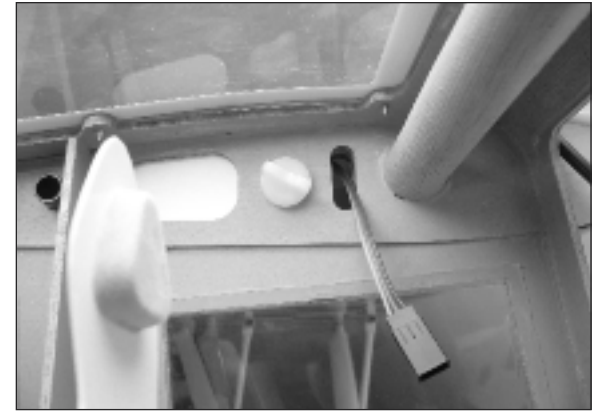
Step 7

Slide the wing onto the wing tube. Pass the aileron lead through the slot behind the wing tube and insert the alignment tube into its hole in the fuselage as the wing is pushed on completely.



Step 8

Install the 1/4-20 x 1 1/2-inch nylon wing retaining bolt.



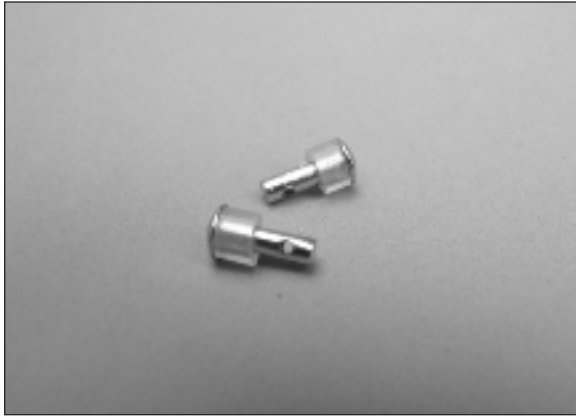
Step 9

Connect the aileron lead from the wing to the aileron lead from the receiver.



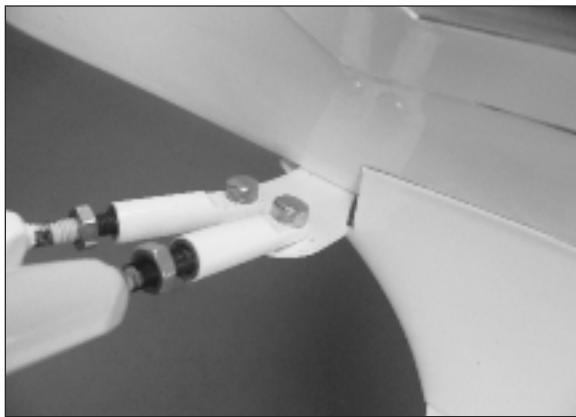
□□ **Step 10**

Prepare the strut pins by sliding on a silicone spacer.



□□ **Step 11**

Adjust the length of the strut end fittings by turning them as needed to align them with the strut fitting on the fuselage. Insert the strut pins and spacers.



□□ **Step 12**

Insert the keepers in the strut pins.



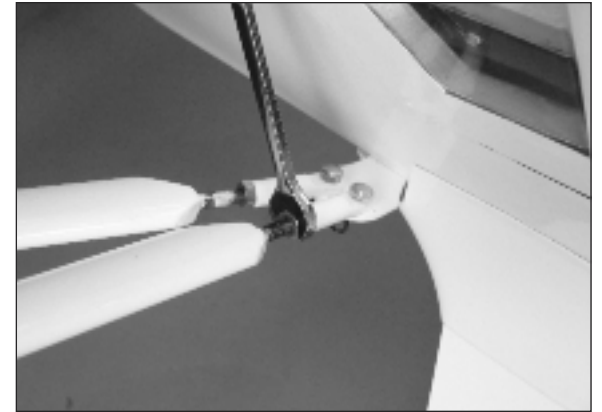
□□ **Step 13**

Apply a drop of threadlock to the threads at the end of the strut fitting.



□□ **Step 14**

Use a 9/32-inch open-end wrench to tighten the hex nut against the strut end fitting.



Repeat steps 7 through 14 for the opposite side.

□□ **Step 15**

Install the pilot figure, shown here with helmet and life jacket removed. The boots have also been removed for ease of installation.



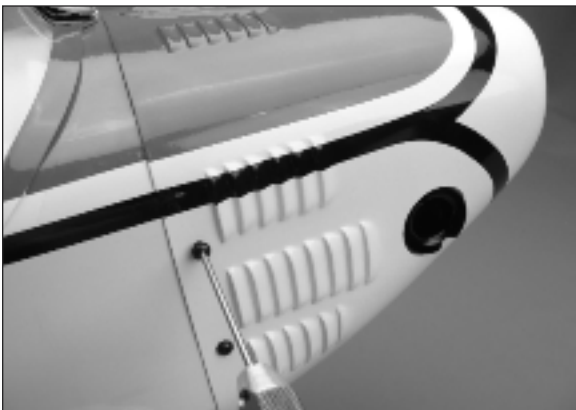
□ Step 16

Remove the fuel dot plug from the fill line and slide the cowl partially onto the fuselage. Feed the fuel fill and vent lines through the holes in the lower cowl. Insert the plug in the fill line and retain the secure the vent line with a small cable tie. Do not tighten the cable tie so much that the tube is constricted.



□ Step 17

Secure the cowl with four 4-40 x 1/2-inch button head machine screws using a 5/64-inch hex wrench.



□ Step 18

Install the spinner and propeller with the appropriately sized wrench for the engine being used.



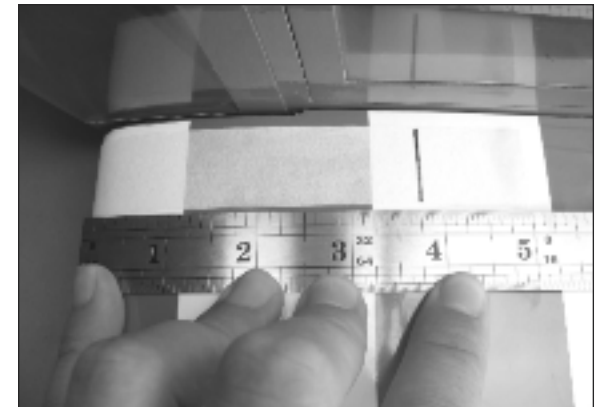
Center of Gravity

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 3 3/4-inch (95mm) behind the leading edge of the wing (25% chord). Mark the location for the Center of Gravity on a piece of low-tack tape on the bottom of the wing next to the fuselage as shown.

When balancing your model, support the plane upright at the marks made on the bottom of the wing with your fingers or a commercially available balancing stand. This is the correct balance point for your model. You might find you need to add a small amount of weight to either the front or back of the fuselage to achieve the correct balance.



After the first flights, the CG position may be adjusted to suit your personal preference. Prototypes have been flown with the CG as far back as 4 1/8-inch (105mm).

Control Throws

□ Step 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.

□ Step 2

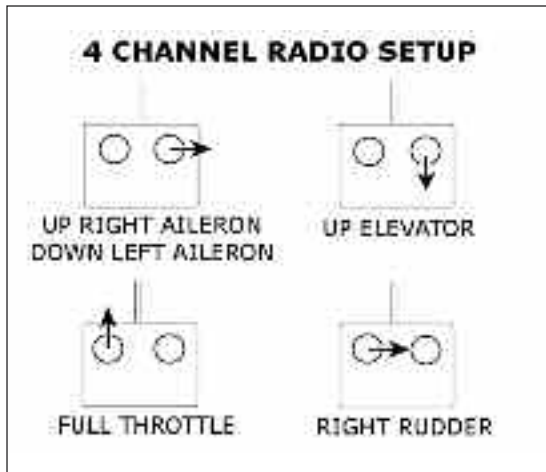
Check the movement of the elevator with the radio system. Moving the elevator stick toward the bottom of the transmitter will make the airplane elevator move up.

□ Step 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.

□ Step 4

Use a ruler to adjust the throw of the elevator, ailerons and rudder.



Aileron High Rate

Up	1 1/2-inch	(38mm)
Down	15/16-inch	(24mm)

Aileron Low Rate

Up	1-inch	(25mm)
Down	9/16-inch	(14mm)

Elevator High Rate

Up	2-inch	(51mm)
Down	2-inch	(51mm)

Elevator Low Rate

Up	1 1/8-inch	(29mm)
Down	1 1/8-inch	(29mm)

Rudder High Rate

Left	3 1/4-inch	(83mm)
Right	3 1/4-inch	(83mm)

Rudder Low Rate

Left	1 7/8-inch	(48mm)
Right	1 7/8-inch	(48mm)

Note: Measurements are taken at the inner or widest point on the control surface.

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.

Flight Preparations

Flight preparations should be performed each time you travel to the flying field. Because your model will encounter a variety of situations, it is best to keep an eye on the various components of your model to keep it in the best flying condition.

□ Checking the Frequency

When using a Spektrum radio system, follow the guidelines for use of DSM radio systems at your particular field.

□ Checking the Controls

Before starting your engine, check to make sure the controls are operating in the correct directions and the linkages and surfaces are not binding anywhere. Also look at the clevises and clevis retainers to make sure they are secure and will not come loose or fail in flight.

□ Fueling your Model

Fill the fuel tank with the proper fuel. Fill the tank by connecting the fuel pump to the line going to the needle valve or to the fuel dot on the side of the cowling. Disconnect the fuel line attached to the pressure fitting of the muffler; your tank is full when fuel begins to run out of the pressure or vent line. Reconnect the fuel lines to the needle valve assembly or insert the plug into the fuel dot and connect the line to the muffler.

Note: It is very important to reconnect the lines to the correct place. If they are reconnected incorrectly, the engine will not run properly.

Maintaining Your Model

The following is a check list you should follow every time you have completed a flying session with your model. Doing so will keep your aircraft in the best flying condition.

□ Clean Up

After a long flying session with your model, you will want to clean it before loading it into your vehicle to head home. Use a cleaner and a paper towel to wipe down the exterior of your plane, removing the fuel residue. Remember, a clean airplane will last longer since the fuel won't be able to soak into any exposed wood.

□ Checking the Propeller

Check to make sure the propeller is tightly secured to the engine. If not, remove the spinner and use a wrench to tighten it. If you have had any not so great landings, you will want to inspect the propeller for any damage. Small nicks and scratches can quickly become fractures, causing the propeller to be unsafe for flight. Always carry a few spare propellers so a damaged propeller can be replaced at the field, increasing your flying time per trip to the field.

□ Checking the Clevises

Inspect the aileron, elevator and rudder clevises to make sure they are connected and in good working order. If you find a clevis that is showing signs of wear or is broken, replace it with a new clevis. Also check the nylon connectors at the servo for any wear or damage. If they look worn or in bad shape, replace them as well.

□ Checking the Control Horns

Inspect the control horns to make sure they have not crushed the wood of the control surface. If so, remove the control horn screws to remove the control horn. Place 2–3 drops of thin CA into each of the screw holes. In addition, use a T-pin to poke small holes in the covering in the area where the control horn mounts, then saturate the area with thin CA. This will harden the wood and give the control horns a solid surface to be mounted to.

□ Checking the Wheel Collars

Check the setscrews on the wheel collars for the main and tail wheel to make sure they are not loose. Use a hex wrench to tighten the setscrews. It is suggested if they loosen frequently to remove them, reapply threadlock to the setscrews, then secure the wheel collars back into position.

□ Check the Muffler Bolts

Use the appropriate hex wrench to make sure the hardware holding the muffler onto the engine is tight and has not vibrated loose during flight.

□ Check the Engine Mount Bolts

Remove the spinner (if used) and propeller from the engine. Remove the cowling, and if necessary remove the muffler to gain access to the engine mounting bolts. Use a Phillips screwdriver or hex wrench to make sure the four bolts securing the engine to the mount or firewall are tight.

Safety Do's and Don'ts for Pilots

- Ensure that your batteries have been properly charged prior to your initial flight.
- Keep track of the time the system is turned on so you will know how long you can safely operate your system.
- Perform a ground range check prior to the initial flight of the day. See the “Daily Flight Checks Section” for information.
- 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 point the transmitter antenna directly toward the model. The radiation pattern from the tip of the antenna is inherently low.
- 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.

Dual Rate Recommendations

- We recommend that the rudder dual rate be set to Low for takeoff to help minimize overcorrection during the takeoff roll.
- We recommend the rudder dual rate be set to High for landing to help maintain heading as the model transitions from flying speed to taxi speeds.
- Elevator and Aileron dual rates should be adjusted for personal feel and also if there are any unusual wind conditions.

Age Requirements

Age Recommendation: 14 years or over. This is not a toy. This product is not intended for use by children without direct adult supervision.

Daily Flight Checks

Step 1

Check the battery voltage on both the transmitter and the receiver battery packs. Do not fly below 9.5V on the transmitter if you are using a JR or Spektrum transmitter that uses 8-cells to power the transmitter. Do not fly if the receiver pack is at or below 4.7V. To do so can crash your aircraft.

Note: When you check these batteries, ensure that you have the polarity correct on your expanded scale voltmeter.

Step 2

Check all hardware (linkages, screws, nuts, and bolts) prior to each days flight. Be sure that binding does not occur and that all parts are properly secured.

Step 3

Ensure that all surfaces are moving in the proper manner.

Step 4

Perform a ground range check before each flying session.

Step 5

Prior to starting your aircraft, turn off your transmitter, then turn it back on. Do this each time you start your aircraft. If any critical switches are on without your knowledge, the transmitter alarm will warn you at this time.

Step 6

Check that all trim levers are in the proper location.

Step 7

All servo pigtails and switch harness plugs should be secured in the receiver. Make sure that the switch moves freely in both directions.

Safety, Precautions and Warnings

As the user of this product, you are solely responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) that you use.

This model is controlled by a radio signal that is subject to interference from many sources outside your control. This interference can cause momentary loss of control so it is necessary to always keep a safe distance in all directions around your model, as this margin will help to avoid collisions or injury.

- Always operate your model in an open area away from cars, traffic or people.
- Avoid operating your model in the street where injury or damage can occur.
- Never operate the model out into the street or populated areas for any reason.
- Never operate your model with a low transmitter battery.
- Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) that you use.
- Keep all chemicals, small parts and anything electrical out of the reach of children.
- Moisture causes damage to electronics. Avoid water exposure to all equipment not specifically designed and protected for this purpose.

Warranty Information

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

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

(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).

SAFETY PRECAUTIONS

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. The Product 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 injury.

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.

IINSPECTION 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. Nonwarranty 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 UK
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.

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.



2009 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 radiocontrol 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 the pilot's helper(s) 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.



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