

# HANGAR 9

## *FuntanaX 50 ARF*

### ASSEMBLY MANUAL



#### Specifications

Wingspan: ..... 56 in (1422mm)  
Length: ..... 56 in (1441mm)  
Wing Area: ..... 714 sq in (46.1 sq dm)

Weight: ..... 4–5.5 lb (1.8 kg–2.5 kg)  
Radio: ..... 4-channel w/5 servos  
Engines: ..... 32–.46 2-stroke, .40–.72 4-stroke

# Contents

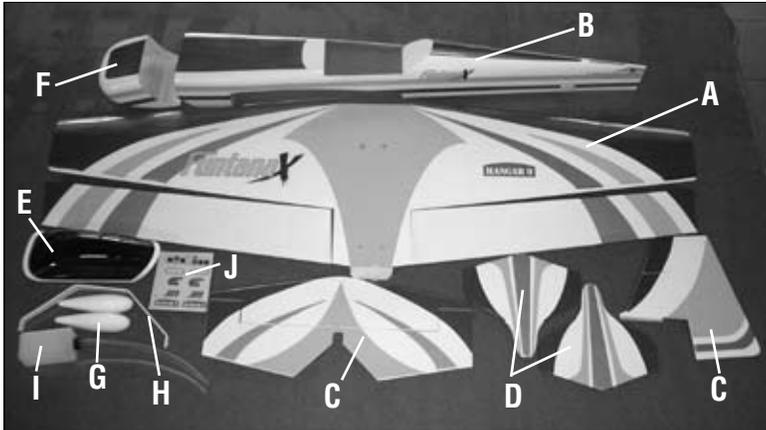
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# Introduction

The FuntanaX 50 can do it all—harriers, torque rolls, blenders, and almost anything else you can dream up. It's all possible, thanks to an extremely lightweight, all-wood airframe and big control surfaces that give the FuntanaX 50 a very impressive thrust-to-weight ratio and crisp control authority at any airspeed. The genuine UltraCote® trim scheme and factory painted parts, such as the cowl and wheel pants, complement the performance perfectly.

## Contents of Kit



### Large Parts:

A. Wing	HAN4151
B. Fuselage	HAN4152
C. Tail Set	HAN4153
D. Side Force Generator Set	HAN4154
E. Canopy	HAN4155
F. Cowling	HAN4157
G. Fiberglass Wheel Pants	HAN4158
H. Aluminum Landing Gear	HAN4159
I. Fuel Tank (Assembled)	HAN4162
J. Decal Set	HAN4161

### Items Not Shown:

Hardware Pack	HAN4160
Tail Wheel Assembly	HAN4163
2 1/4" (57mm) Wheels	HAN303
Carbon Fiber Tail Support Rod Set	HAN4156

## Radio and Power Systems Requirements

- 6-channel radio system (minimum)
- 9" Servo Lead Extension (JRPA097) (2)
- Large Servo Arm (JRPA212) (2)
- 537 Standard Servo (JRPS537) (5) or equivalent
- 12" Servo Lead Extension (JRPA098) (2)
- Propeller (low pitch, large diameter recommended)

### Recommended JR Systems

- PCM10X
- XP8103
- X-378
- XP662
- XF631



JR XP9303



JR XP6102

### Recommended Power Systems

- .40-.48 2-stroke
- .40-.82 4-stroke
- Power 60 Brushless Outrunner



Evolution .46NT  
EVOE0460



Saito .82 AAC  
SAIE082A



Power 60 Brushless  
Outrunner Motor, 400KV  
EFLM4060A

## Limited Warranty Period

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Horizon Hobby, Inc. guarantees this product to be free from defects in both material and workmanship at the date of purchase.

## Limited Warranty & Limits of Liability

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Pursuant to this Limited Warranty, Horizon Hobby, Inc. will, at its option, (i) repair or (ii) replace, any product determined by Horizon Hobby, Inc. to be defective. In the event of a defect, these are your exclusive remedies.

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 an authorized Horizon Hobby, Inc. service center. This warranty is limited to the original purchaser and is not transferable. In no case shall Horizon Hobby's liability exceed the original cost of the purchased product and will not cover consequential, incidental or collateral damage. Horizon Hobby, Inc. 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 Hobby, Inc. Further, Horizon Hobby reserves the right to change or modify this warranty without notice.

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. HORIZON HOBBY, INC. SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

As Horizon Hobby, Inc. 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.

## Safety Precautions

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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

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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 Hobby, Inc. directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance.

## Questions or Assistance

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For questions or assistance, please direct your email to [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com), or call 877.504.0233 toll free to speak to a service technician.

# Inspection or Repairs

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If your 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 Hobby, Inc. is not responsible for merchandise until it arrives and is accepted at our facility. Include your complete name, address, phone number where you can be reached during business days, RMA number, and a brief summary of the problem. Be sure your name, address, and RMA number are clearly written on the shipping carton.

# Warranty Inspection and Repairs

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To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Providing 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

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Should your repair not be covered by warranty and the expense exceeds 50% of the retail purchase cost, you will be provided with an estimate advising you of your options. You will be billed for any return freight for non-warranty repairs. Please advise us of your preferred method of payment. Horizon Hobby 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.

Electronics and engines requiring inspection or repair should be shipped to the following address (freight prepaid):

Horizon Service Center  
4105 Fieldstone Road  
Champaign, Illinois 61822

All other products requiring inspection or repair should be shipped to the following address (freight prepaid):

Horizon Product Support  
4105 Fieldstone Road  
Champaign, Illinois 61822

# Required Tools and Adhesives

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## Tools

- Canopy Scissors
- Drill
- Flat blade screwdriver
- Hobby knife
- Phillips screwdriver (large)
- Pliers
- Sandpaper
- Drill bit: 1/16" (1.5mm), 1/8" (3mm)
- Foam: 1/4" (6mm)
- Masking tape
- Phillips screwdriver (small)
- Ruler
- Square

## Adhesives

- 6-minute epoxy (HAN8000)
- Thin CA (cyanoacrylate) glue
- CA remover/debonder
- Canopy glue (RC-56)
- 30-minute epoxy (HAN8002)
- Thick CA (cyanoacrylate) glue
- Pacer Z-42 Threadlock
- Masking tape (3M blue recommended)

## Other Required Items

- Epoxy brushes
- Measuring device (e.g. ruler, tape measure)
- Paper towels
- Radio packing foam
- Sanding bar
- String
- Wax paper
- Felt-tipped pen or pencil
- Mixing sticks for epoxy
- Petroleum jelly
- Rubbing alcohol
- Sandpaper (medium)
- T-pins

## Covering Colors

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- Pearl Blue HANU845
- Cub Yellow HANU884
- Silver HANU881

## Required Field Equipment

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- Propeller
- Long Reach Glow Plug Wrench (HAN2510)
- 2-Cycle Sport Plug (HAN3001)
- 4-Cycle Super Plug (HAN3011)
- Fuel
- Metered Glow Driver w/Ni-Cd & Charger (HAN7101)
- 2-Cycle Super Plug (HAN3006)
- Manual Fuel Pump (HAN118)

## Warning

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

## Using the Manual

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

## Before Starting Assembly

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Before beginning the assembly of the FuntanaX 50, remove each part from its bag for inspection. Closely inspect the fuselage, wing panels, rudder, and stabilizer for damage. If you find any damaged or missing parts, contact the place of purchase.

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



**HAN101 – Sealing Iron**

**HAN141 – Sealing Iron  
Sock**



**HAN100 – Heat Gun**

**HAN150 – Covering Glove**

# Section 1: Stabilizer Installation

## Required Parts

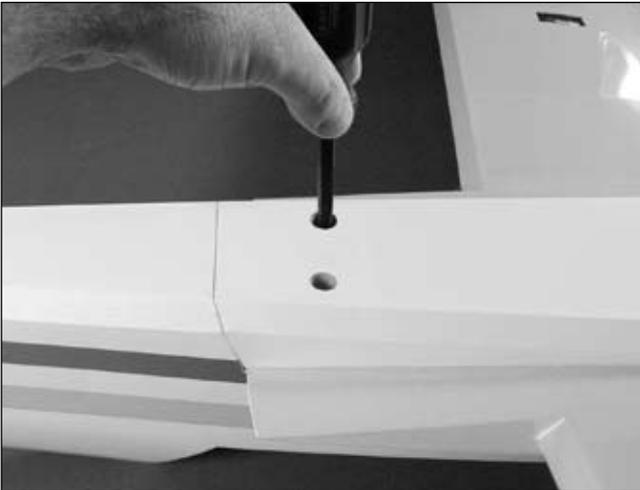
- Wing
- Fuselage
- 1/4-20 x 2" nylon bolt (2)
- Horizontal stabilizer
- Elevator
- Carbon fiber tail support rods

## Required Tools and Adhesives

- Thin CA
- 30-minute epoxy
- Flat blade screwdriver
- Sandpaper
- Drill bit: 1/16" (1.5mm)
- Drill
- Felt-tipped pen
- Square
- CA hinge (6)
- Paper towel
- Rubbing alcohol
- T-pin
- 6-minute epoxy

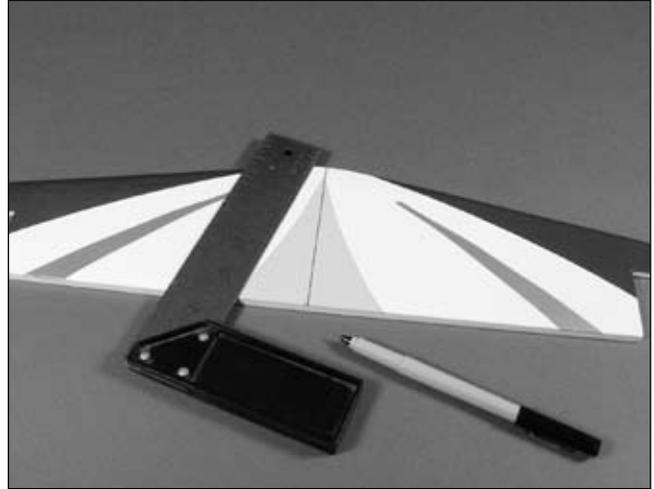
### Step 1

Place the wing onto the fuselage. Secure the wing using the 1/4-20 x 2" nylon bolts.



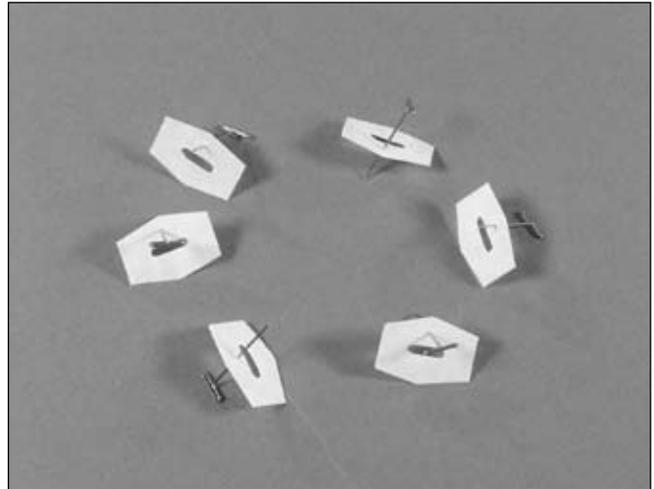
### Step 2

Measure and mark a centerline on the stabilizer using a felt-tipped pen.



### Step 3

Locate six CA hinges. Place a T-pin in the center of each hinge.



## Section 1: Stabilizer Installation

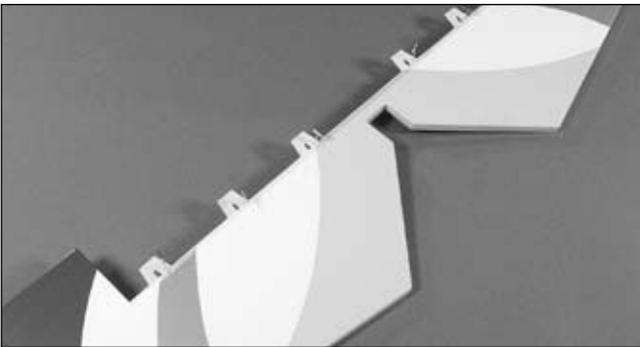
### □ Step 4

Drill a 1/16" (1.5mm) hole in the center of each hinge slot. Drill holes for both the elevator and stabilizer.



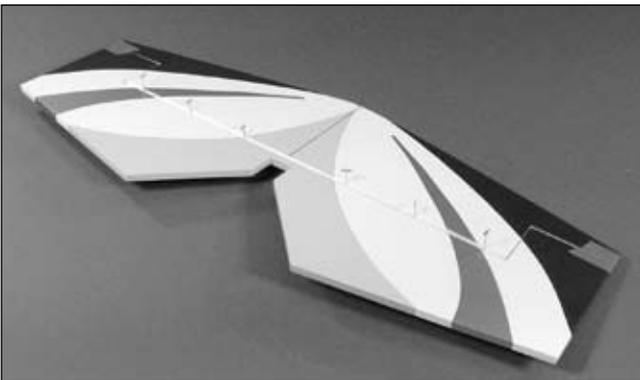
### □ Step 5

Place the hinges in the elevator, resting the T-pins against the leading edge of the elevator.



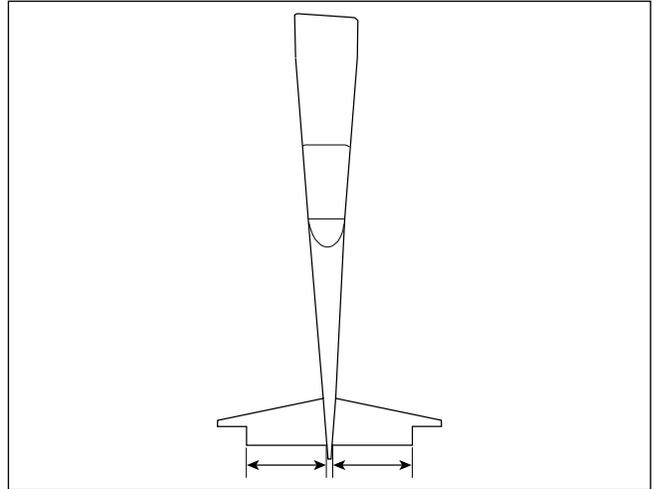
### □ Step 6

Slide the stabilizer and elevator together. Check that the elevator can move without interference from the stabilizer. Use tape at each tip to hold the two together. Do not use CA or any other glue on the hinges at this time.



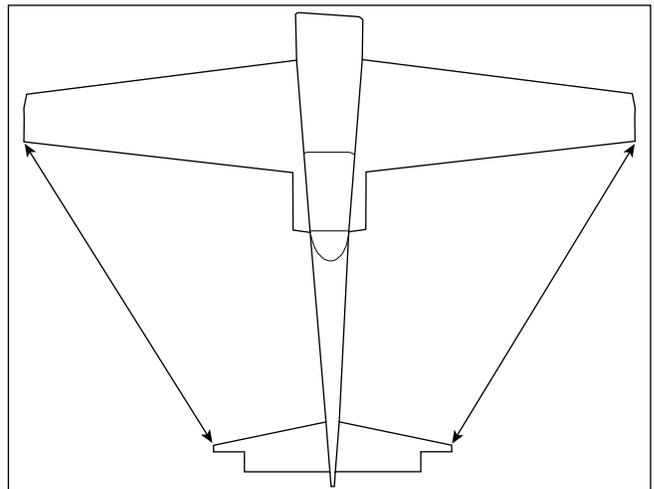
### □ Step 7

Slide the stab into the fuselage. Center the stab in the opening by measuring the distance from the fuselage to each tip. The stab is aligned when both measurements are identical.



### □ Step 8

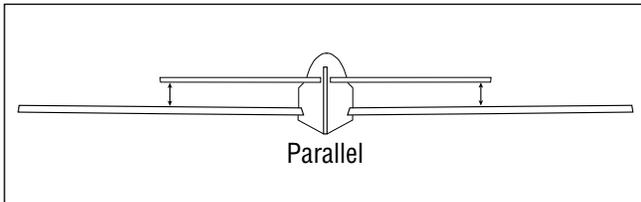
Check the distance from each stab tip to each wing tip. Remember to measure right-to-right, left-to-left. It won't work the other way around. These measurements must also be equal.



## Section 1: Stabilizer Installation

### □ Step 9

The last alignment step is making sure the wing and stabilizer are parallel. If they are not, lightly sand the opening in the fuselage for the stab until the stab rests parallel to the wing.



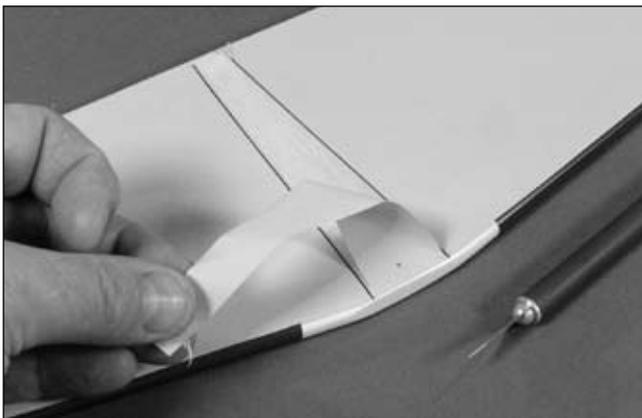
### □ Step 10

Use a felt-tipped pen to trace the outline of the fuselage on the stab.



### □ Step 11

Remove the stabilizer from the fuselage, and the stabilizer from the elevator. Use a hobby knife with a brand new blade to remove the covering 1/16" (1.5mm) inside the lines just drawn.



**Note:** Use care not to cut into the underlying wood and weaken the structure. Doing so will almost guarantee stab failure in flight.

**Hint:** A soldering iron or hot knife can be used as an option to the standard hobby knife.

**Cool Tip:** Use a little rubbing alcohol and a paper towel to remove those felt-tipped marker lines once they are no longer needed.

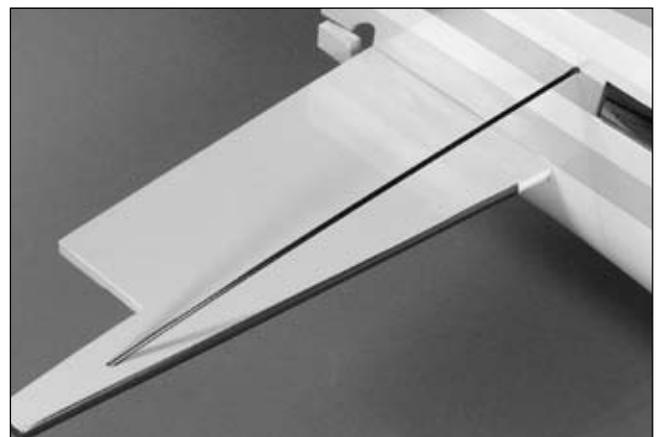
### □ Step 12

Double-check the alignment, to verify it's correct. Mix up 1/2 ounce (15 ml) of 30-minute epoxy. Apply the epoxy to the exposed wood of the stabilizer and into the slot in the fuselage. Slide the stabilizer into position and remove any excess epoxy using a paper towel and rubbing alcohol. After the epoxy fully cures, apply a thin bead of epoxy to the joint to fill any gaps and to fuel-proof the joint.



### □ Step 13

Roughen up about 1/4" (6mm) of each end of the carbon tail support using sandpaper. Test fit the carbon tail support into the hole drilled in the fuse and notch in the stabilizer. Use 6-minute epoxy to glue the rod into position. Install both carbon tail supports.



## Section 2: Vertical Fin Installation

### Required Parts

- Wing
- Fuselage
- Vertical stabilizer

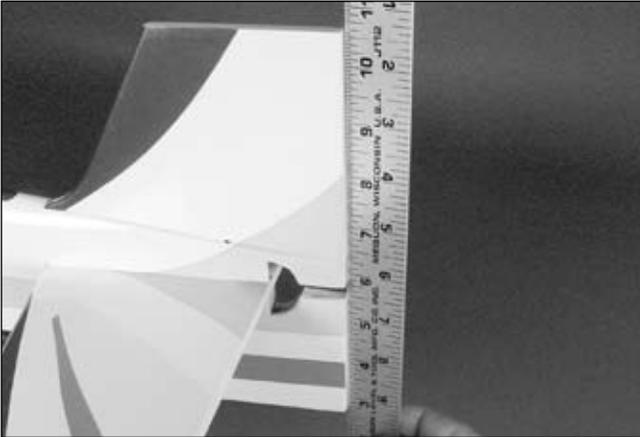
### Required Tools and Adhesives

- 30-minute epoxy
- Sandpaper
- Square
- Ruler

The vertical stabilizer (fin) is a bit easier to install than the stab. There is still some alignment that must be done, but it is a lot less tricky.

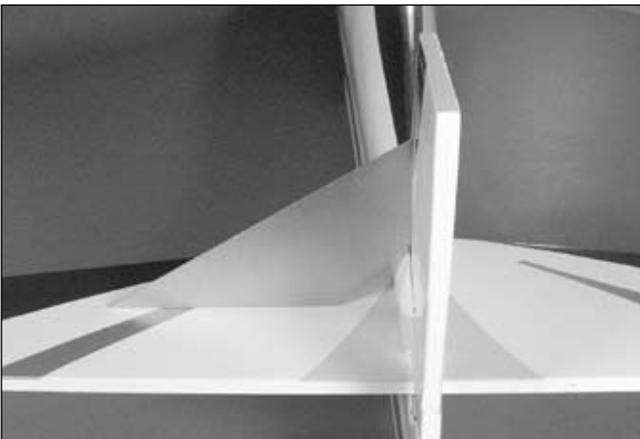
#### □ Step 1

Locate the vertical stabilizer (fin) and slide it into position. Position the fin so it aligns with the aft end of the fuselage. Use a ruler to check the alignment.



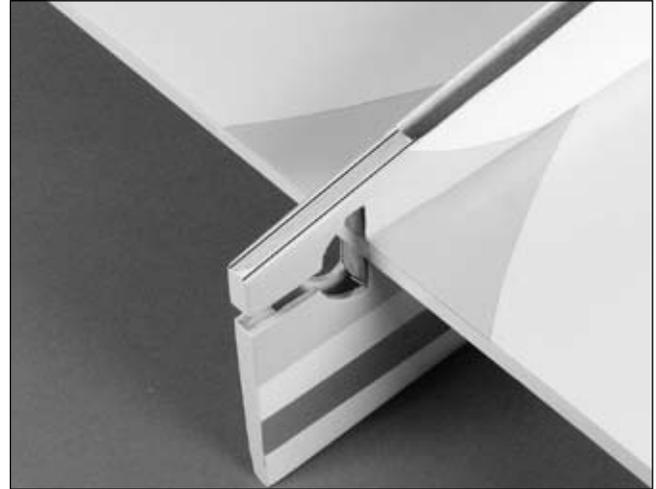
#### □ Step 2

Check the alignment between the fin and stab. The fin must be 90 degrees to the stab to be in alignment. Sand the opening in the fuselage slightly if necessary to get the perfect alignment.



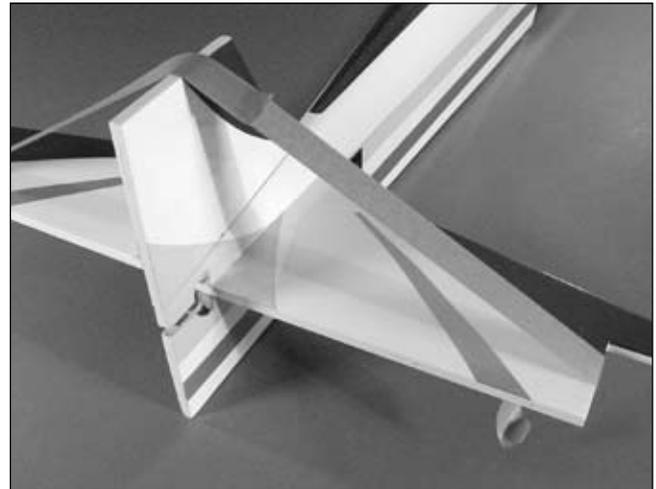
#### □ Step 3

Use a ruler to draw two lines from the end of the slot onto the fuselage as shown. Use a sharp hobby knife to remove the covering from between the lines.



#### □ Step 4

Mix 1/2 ounce (15ml) of 30-minute epoxy. Apply the epoxy to the tab on the fin and to the area on the top of the fuselage where the covering was removed. Position the fin in the slot and check the alignment. Use masking tape to hold the fin in position until the epoxy fully cures.



**Cool Tip:** Use rubbing alcohol and a paper towel to clean up any excess epoxy. Remember, this only works before the epoxy cures.

# Section 3: Hinging the Ailerons

## Required Parts

- Wing
- CA hinges (10)
- Aileron (left and right)

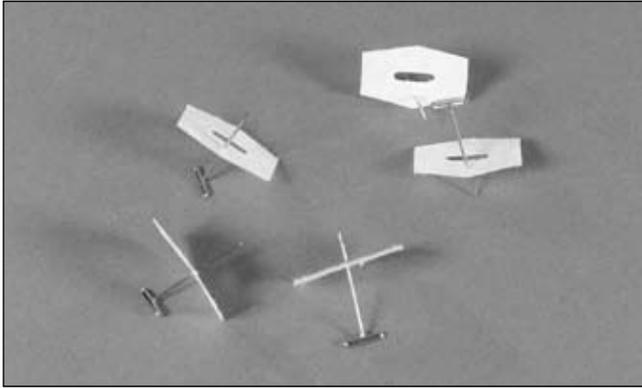
## Required Tools and Adhesives

- Thin CA
- T-pins
- Drill bit: 1/16" (1.5mm)
- Drill

We recommend that you use the hinges provided. They work extremely well when installed as described. Even though the ailerons are large, we had absolutely no problems.

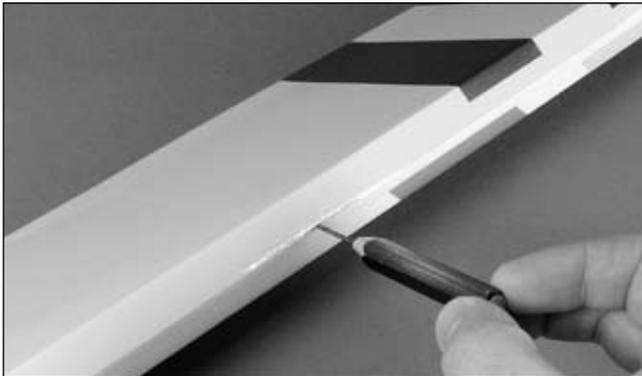
### Step 1

Locate 5 of the CA hinges. Place a T-pin in the center of the hinges.



### Step 2

Drill a 1/16" (1.5mm) hole in the center of each hinge slot on both the aileron and wing.



### Step 3

Place the hinges in the precut slots in the aileron (or wing if you prefer). The T-pin will rest against the edge when installed correctly.

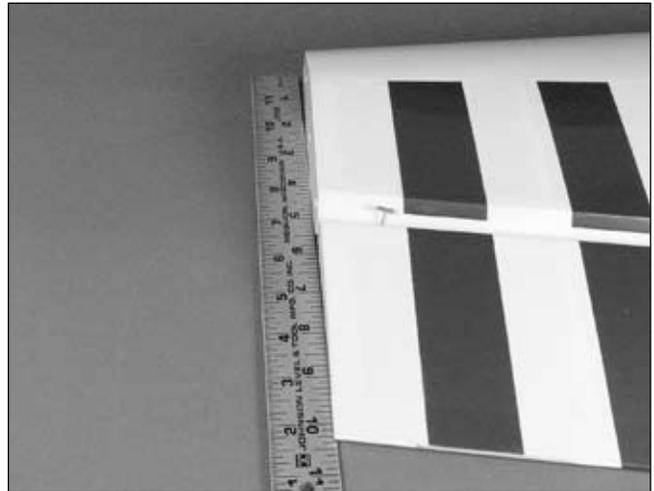
### Step 4

Slide the aileron and wing together. The gap between the aileron and wing should be infinitely small, approximately 1/64" (.4mm).



### Step 5

Use a ruler to align the end of the aileron to the wing. The aileron should set back away from the ruler slightly. If not, they will interfere with the side force generators when they are in place on the wing tips. Also check the gap between the wing and aileron at the root, which should be about 1/32"–1/16" (.8mm–1.5mm).



## Section 3: Hinging the Ailerons

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

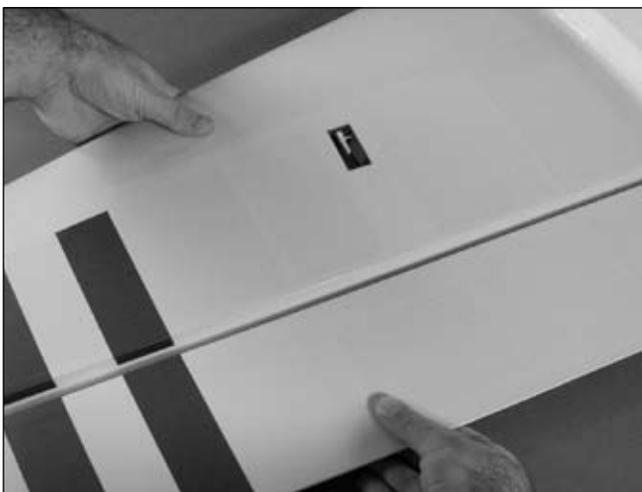
### □ □ Step 6

Remove the T-pins from the hinges. Deflect the aileron and apply thin CA to each hinge. Make sure the hinge is fully saturated with CA. Use a paper towel and CA remover/debonder to clean up any excess CA from the wing and/or aileron.



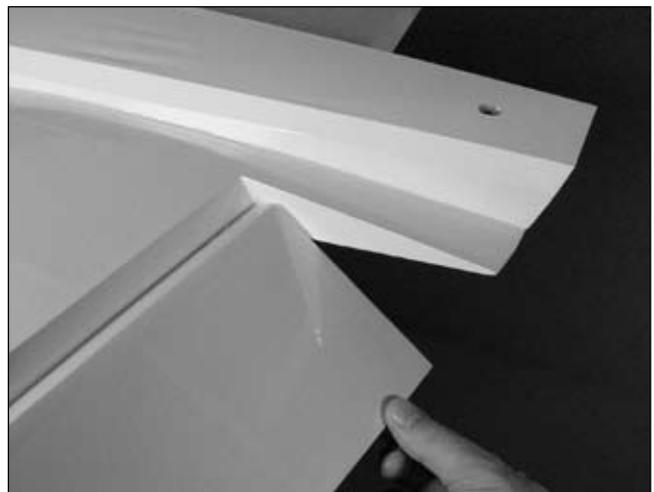
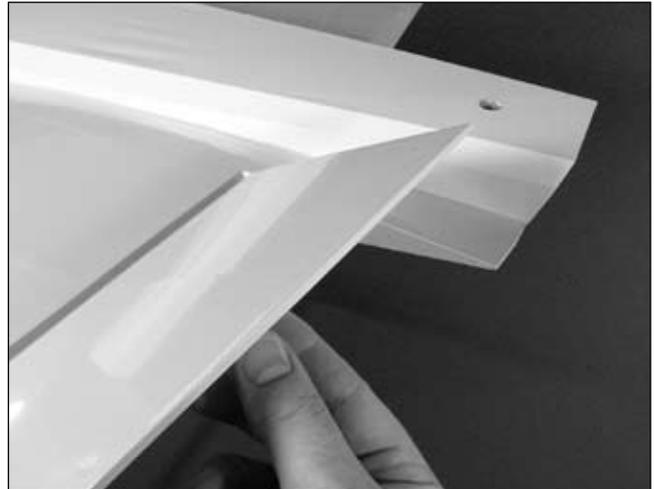
### □ □ Step 7

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



### □ □ Step 8

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



### □ Step 9

Repeat Steps 1 through 8 for the remaining aileron.

# Section 4: Rudder and Elevator Installation

## Required Parts

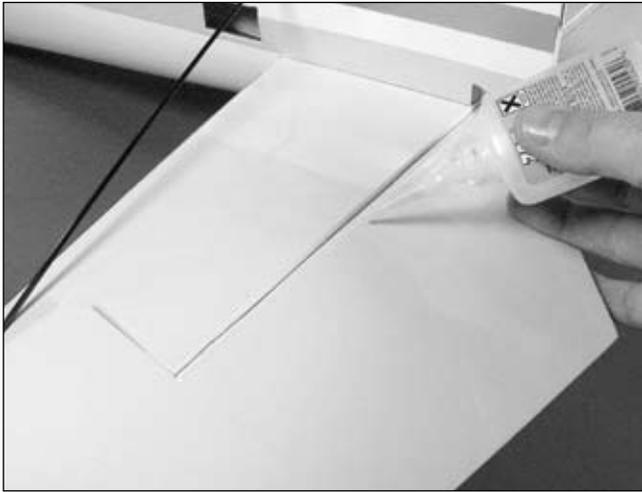
- Fuselage assembly
- Elevator (left and right)
- Tail wheel assembly
- CA hinge (3)
- Rudder
- Fuselage filler

## Required Tools and Adhesives

- Thin CA
- Medium sandpaper
- 6-minute epoxy
- T-pins
- Hobby knife
- Petroleum jelly

### □ Step 1

If you haven't done so, slide the elevator and stab together. Double check that the elevator can move without interfering with the stabilizer. Check to make sure the elevator can move freely. It should not rub against the stabilizer towards the tips. Apply thin CA to both sides of the hinge. Make sure to saturate the hinge and don't use accelerator.

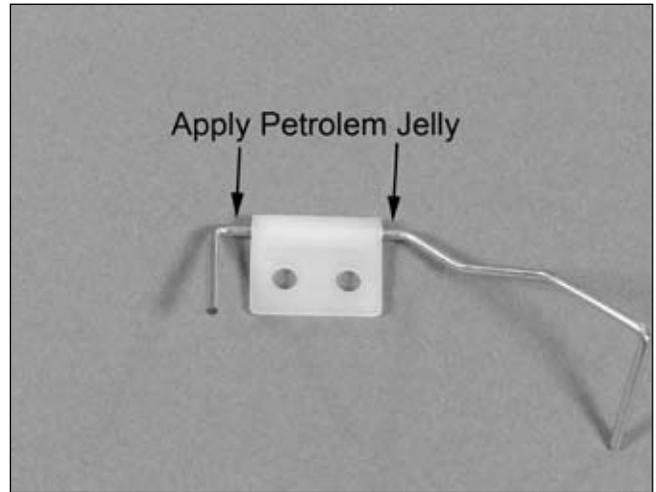


### □ Step 2

Once the CA has fully cured, give the elevator and stab the tug test to make sure the hinges are well glued. Flex the elevator a few times to break in the hinges.

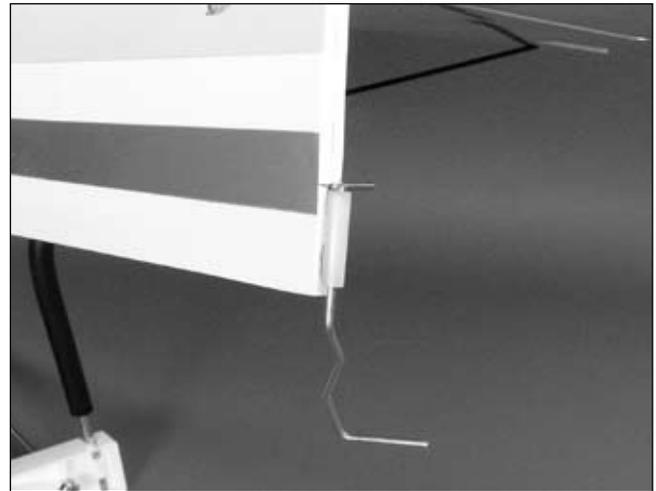
### □ Step 3

Apply a light coat of petroleum jelly onto the tail gear wire where the bearing will ride. This is done to prevent the epoxy from sticking to the wire and bearing, which would make it a little difficult to steer or even use the rudder.



### □ Step 4

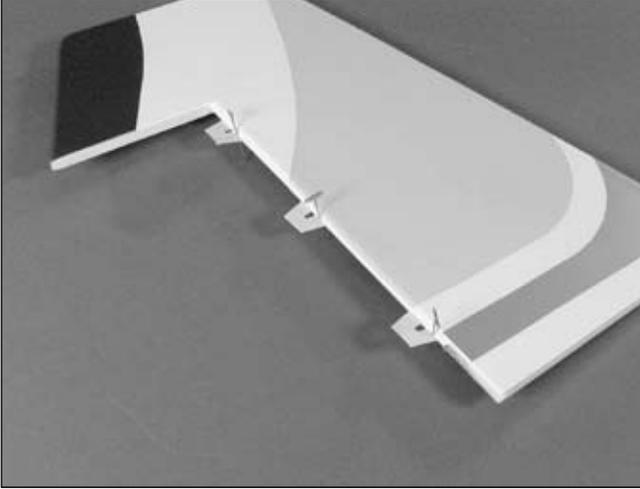
Mix 1/2 ounce (15 ml) of 6-minute epoxy and apply it to both the tail gear bearing and the slot in the fuselage. Install the bearing. Use a paper towel and rubbing alcohol to remove any excess epoxy from the tail gear wire, bushing, and fuselage.



## Section 4: Rudder and Elevator Installation

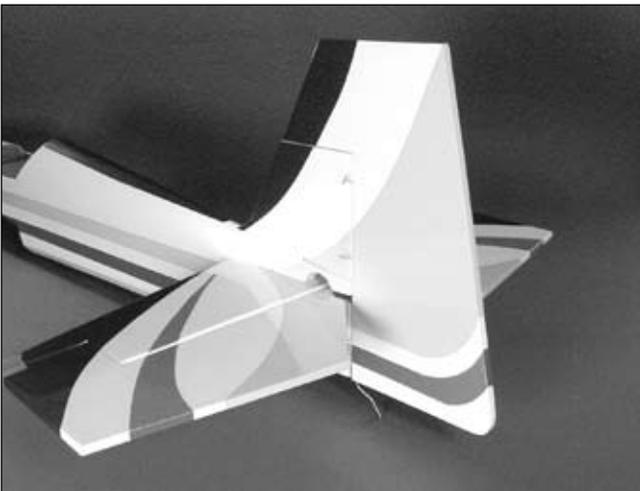
### □ Step 5

Locate the last three CA hinges, and place T-pins in the center, as was done for the ailerons and elevator. Install the hinges in the rudder.



### □ Step 6

Test fit the rudder to the fuselage. Make sure the tail gear wire goes into the rudder, and that the rudder will rest tight against the fin and fuselage. The tail gear bearing should not interfere with the rudder. If it does, fix it.



### □ Step 7

Mix 1/2 ounce (15 ml) of 6-minute epoxy. Remove the rudder and place the epoxy only in the hole, not in the groove. Epoxy in the groove will probably make it difficult to use the rudder. Install the rudder as described in the previous step.

**Cool Tip:** You can combine the previous step with the following step if you like. This will hold the rudder in position while the epoxy cures.

### □ Step 8

Check to make sure the rudder moves freely. It should not rub against the fin at the tip. Apply thin CA to both sides of the hinge. Make sure to saturate the hinge, and don't use accelerator. Use a paper towel and CA debonder/remover to clean up any excess CA.



### □ Step 9

Once the CA and epoxy has fully cured, give the rudder and fin the tug test to make sure the hinges are well glued. Flex the rudder a few times to break in the hinges.

### □ Step 10

This section is completed by using thin CA to glue the fuselage filler into position.



# Section 5: Wheel Installation

## Required Parts

- Landing gear
- 1" (25mm) tail wheel
- 2 1/4" (57mm) wheel (2)
- 4-40 blind nut (2)
- Fuselage assembly
- 6-32 x 1/2" screw (2)
- Wheel pant (left and right)
- 5/32" x 1 1/8" axle w/nut (2)
- 1/16" wheel collar w/setscrew
- 4-40 x 1/2" socket head screw (2)
- 5/32" wheel collar w/setscrew (4)

## Required Tools and Adhesives

- Phillips screwdriver (large)

### □ □ Step 1

Locate the main landing gear and two 6-32 x 1/2" screws. Attach the gear using the screws. The angle on the gear should be towards the rear of the plane.



### □ □ Step 2

Attach an axle to the landing gear using a nut.



### □ □ Step 3

Attach the wheel to the axle using two wheel collars and setscrews. The exact position of the wheel will be determined after the wheel pant is installed.



**Cool Tip:** Position the setscrews on the wheel collars facing directly down. This way you can get to them later to position the wheel on the axle.

### □ □ Step 4

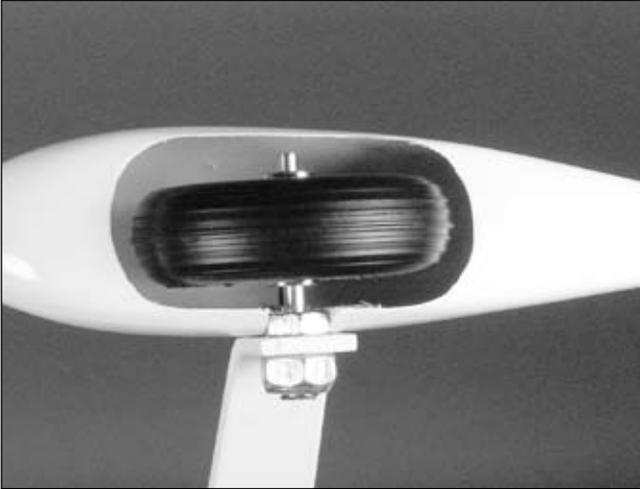
Attach the wheel pant to the landing gear using a 4-40 x 1/2" socket head screw.



## Section 5: Wheel's On!

### Step 5

Position the wheel so it is centered in the wheel pant. Tighten the collars once the wheel has been positioned.



### Step 6

Repeat Steps 2 through 5 for the other wheel pant.

### Step 7

Attach the tail wheel using a 5/32" wheel collar.



**Note:** Use threadlock on all the setscrews to prevent them from loosening during flight.

# Section 6: Engine Installation

## Required Parts

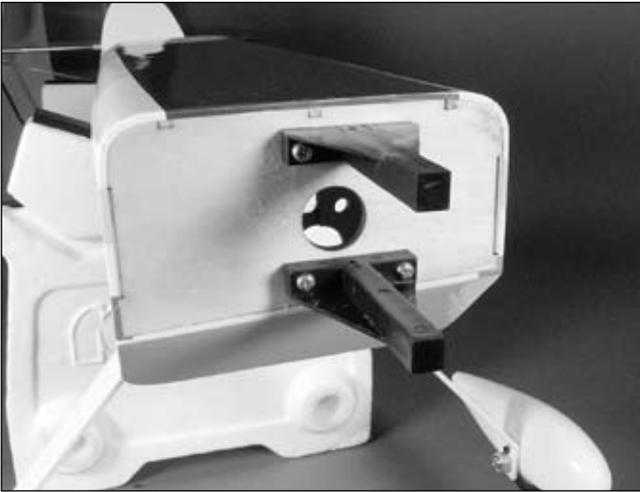
- Fuselage assembly
- Engine mount (2)
- 6-32 x 3/4" screw (4)
- Fuel tank
- 16 3/8" outer pushrod tube
- 18 1/8" pushrod wire
- Clevis w/retainer
- Fuel tubing
- #6 x 5/8" socket head sheet metal screw (4)

## Required Tools and Adhesives

- Masking tape
- Drill
- Pliers
- Clamp
- Engine
- Medium CA
- Phillips screwdriver (large)
- Sandpaper
- Drill bit: 3/32" (2.5mm), 5/32" (4mm)
- Foam: 1/4" (6mm), 1/2" (13mm)

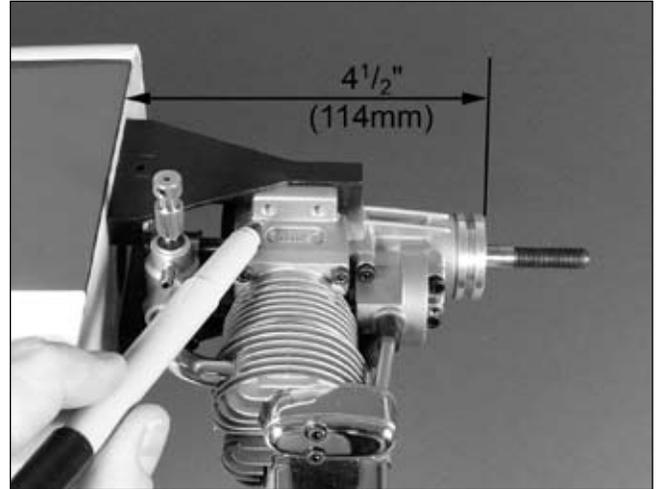
### □ Step 1

Attach the engine mount to the firewall using four 6-32 x 3/4" screws.



### □ Step 2

Position the engine on the mount. Adjust the engine so the distance from the firewall to the drive washer is 4 1/2" (114mm). Use a clamp to hold the engine in position. Mark the locations for the engine mounting bolts.



**Note:** It may be necessary to remove the carburetor from your engine and rotate it so the needle valve faces towards the top of the fuselage.

### □ Step 3

Remove the engine and drill the locations marked in the previous step using a 3/32" (2.5mm) drill bit.



**Cool Tip:** Use a drill press for the best results. This makes holes perfectly perpendicular (square) to the mount.

## Section 6: Engine Installation

### □ Step 4

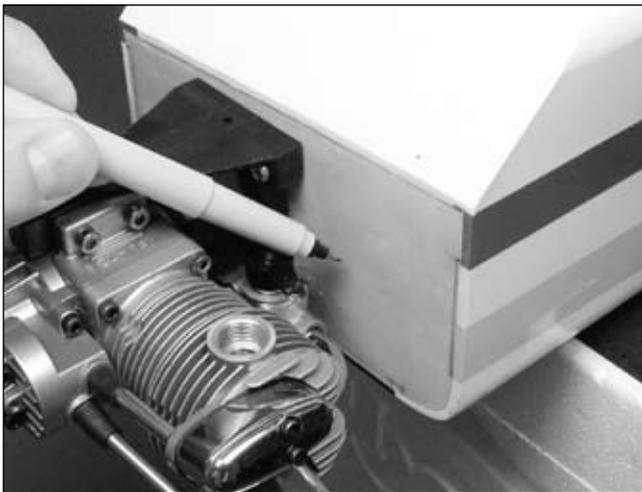
Attach the engine using four #6 x 5/8" socket head sheet metal screws.



**Cool Tip:** Apply a little bar soap to the threads of the screws to make them easier to thread into the mount. You can also remove the mounts and run the screws through, reattach them to the firewall, and then bolt the engine down.

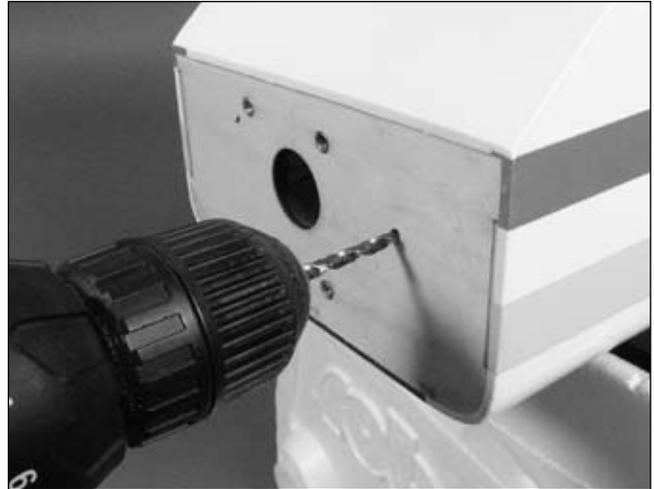
### □ Step 5

Determine the proper location for the throttle pushrod. Mark the location with a felt-tipped pen and drill the firewall for the pushrod tube using a drill and 5/32" (4mm) drill bit. Remove the engine if necessary.



### □ Step 6

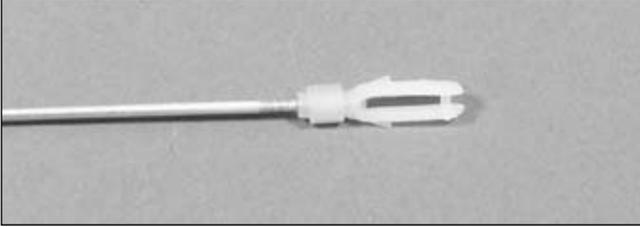
Test fit the throttle pushrod tube through the firewall and into the fuselage. Once satisfied with the fit, roughen the tube using sandpaper. Slide the tube back into position and use medium CA to glue it to the firewall. Allow 1/8" (3mm) of the pushrod to extend forward of the firewall. Trim the throttle pushrod at the front edge of the doubler on the throttle servo tray.



## Section 6: Engine Installation

### □ Step 7

Slide a clevis retainer onto a nylon clevis. Thread a clevis onto an 18 1/8" (460mm) pushrod wire, a minimum of 10 turns.



### □ Step 8

Install the servo hardware (grommets and eyelets) included with the servo. Mount the throttle servo with the output shaft towards the rear of the fuselage.



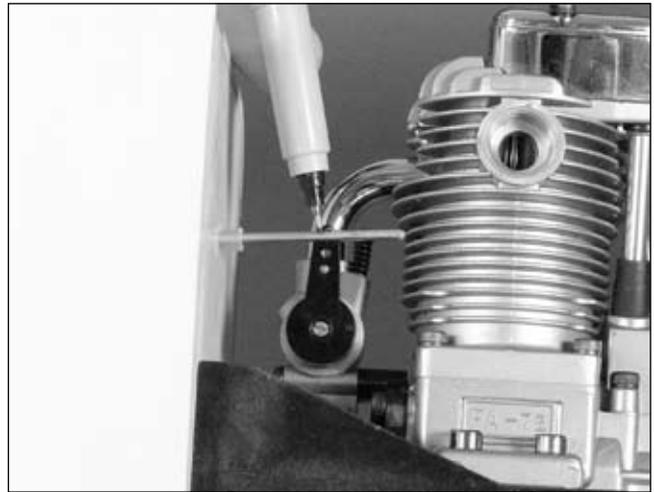
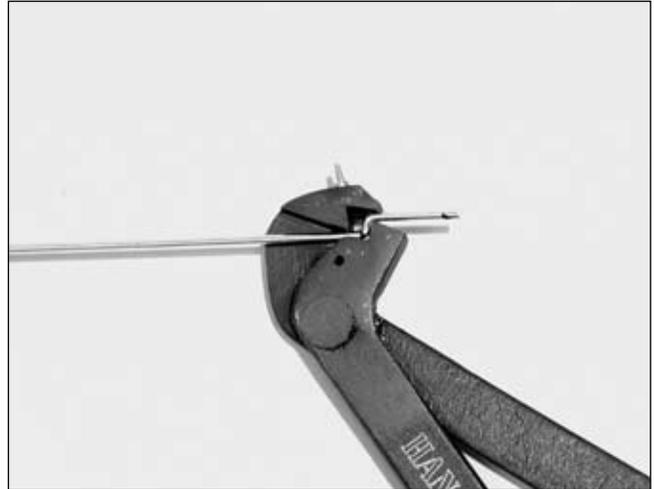
### □ Step 9

Slide the pushrod into place from inside the fuselage and attach the clevis to the servo arm.



### □ Step 10

Move the carburetor to the half-throttle position. Mark the pushrod where it crosses the throttle arm using a felt-tipped pen. Remove the pushrod and make a "Z" bend in the pushrod.



## Section 6: Engine Installation

### □ Step 11

Remove the clevis from the pushrod. Slide the pushrod into the pushrod tube from the firewall. Attach the "Z" bend to throttle arm.



### □ Step 12

Thread the clevis onto the pushrod. Attach the clevis to the throttle arm. Move the throttle to full throttle using the radio. Check the carburetor to make sure it is fully open. Adjust the clevis to correspond full throttle on the radio to full throttle on the carburetor. Use the radio to check low for idle and closed. Move the linkage at the carburetor arm and servo arm as necessary for full range of operation.

### □ Step 13

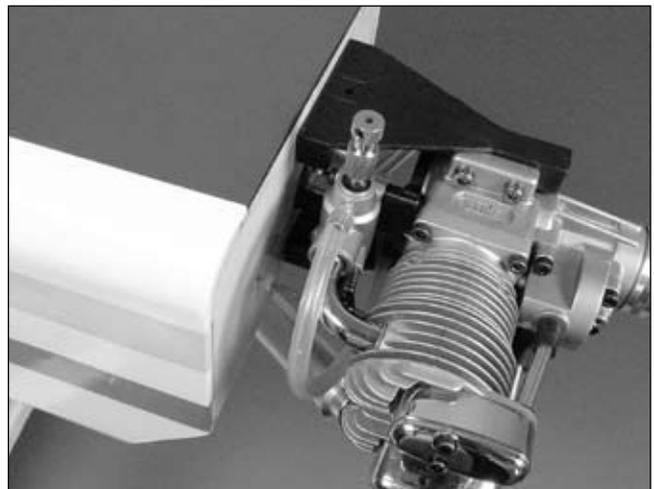
Look at the side of the fuel tank to determine which direction the vent line is facing. It will be installed with the vent towards the top of the fuselage. Also check which piece of tubing is connected to the vent line. Install the fuel tank into the fuselage. Place foam at any point where the fuel tank and fuselage contact each other. Make any necessary supports to keep the tank from moving during flight.



**Cool Tip:** Make sure the rear support brace will not interfere with the installation of the wing.

### □ Step 14

Install the muffler onto the engine, making sure it does not interfere with the firewall. Make the proper connections to the engine using the engine manufacturer's instructions.



# Section 7: Cowling Installation

## Required Parts

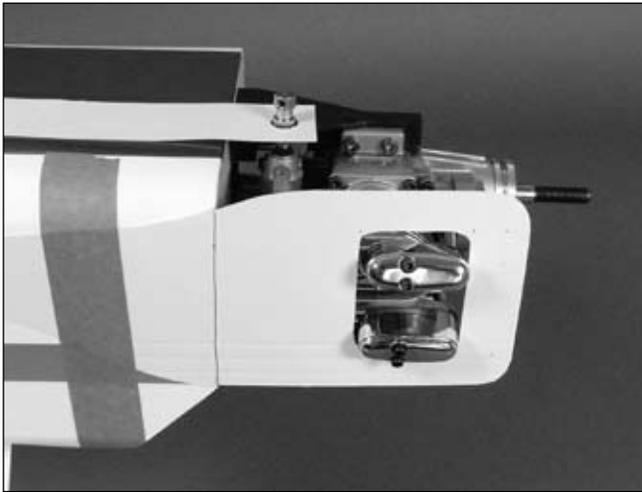
- Fuselage assembly
- Cowling
- #2 x 1/2" sheet metal screw (4)

## Required Tools and Adhesives

- Hobby scissors
- Drill
- Drill bit: 3/32" (2.5mm), 1/8" (3mm)
- Phillips screwdriver (small)
- Rotary tool w/sanding drum

### □ Step 1

Use pieces of cardstock to indicate the location of the engine and firewall.



### □ Step 2

Remove the engine. Position the cowling onto the fuselage so it is 4 9/16" (116mm) from the firewall. Transfer the locations for the engine and needle valve onto the cowling.



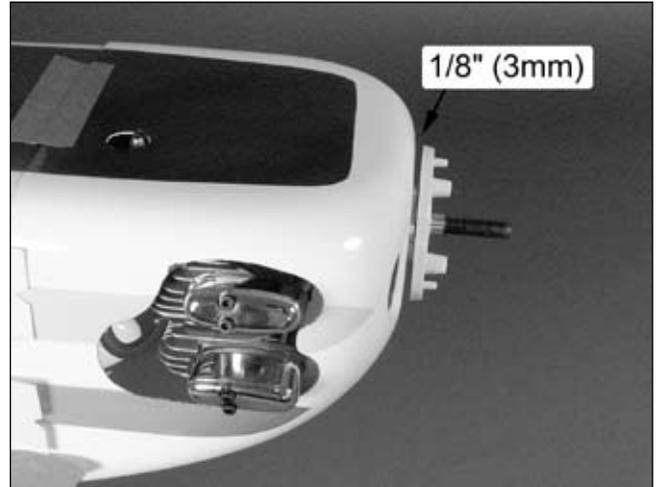
### □ Step 3

Remove the cowl and remove the necessary material to fit the cowl over the engine. Install the engine back onto the firewall, and test fit the cowl over the engine.

**Cool Tip:** Start by removing only a little material at a time. You can always make the holes bigger, but you can't make them smaller. Work until the cowl fits nicely over the engine.

### □ Step 4

Slide the cowling onto the fuselage. Temporarily install the propeller and spinner back plate. Position the cowl so there is 1/8" (3mm) gap between the back plate and the cowl.

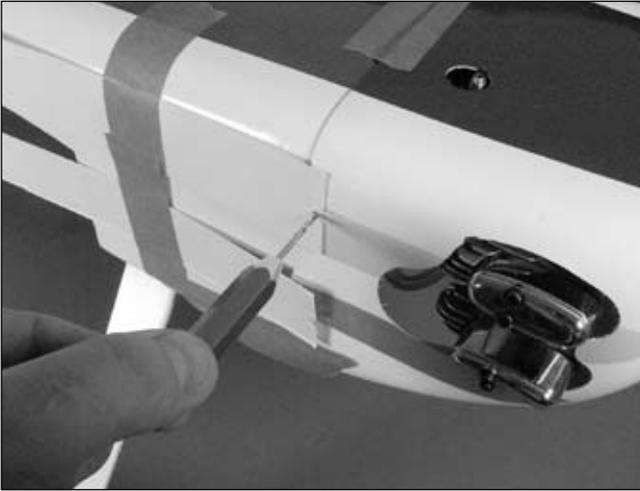


**Cool Tip:** Use tape to hold the cowling in position so you can drill the holes in the following step.

## Section 7: Cowling Installation

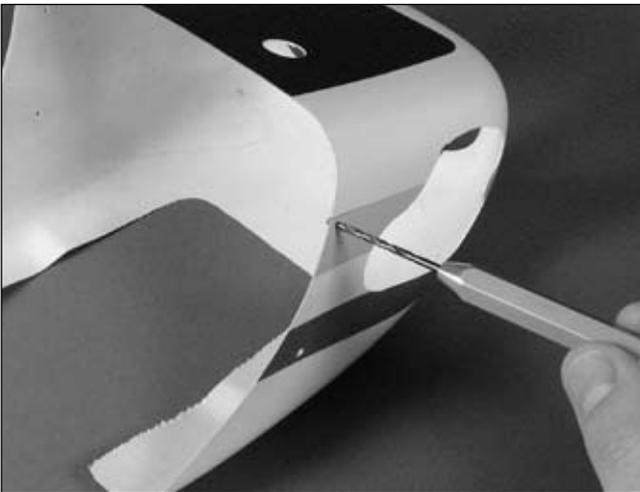
### □ Step 5

Use the cardstock from Step 1 to locate the positions for the cowling screws. The goal is to drill into the firewall for the four screws that hold the cowling. Drill the locations using a 3/32" (2.5mm) drill bit.



### □ Step 6

Enlarge the holes drilled in the cowling using a 1/8" (3mm) drill bit.



### □ Step 7

Apply a couple drops of CA into the screw holes after threading the screws in a few times. This will harden the wood and keep the screws from loosening during flight.

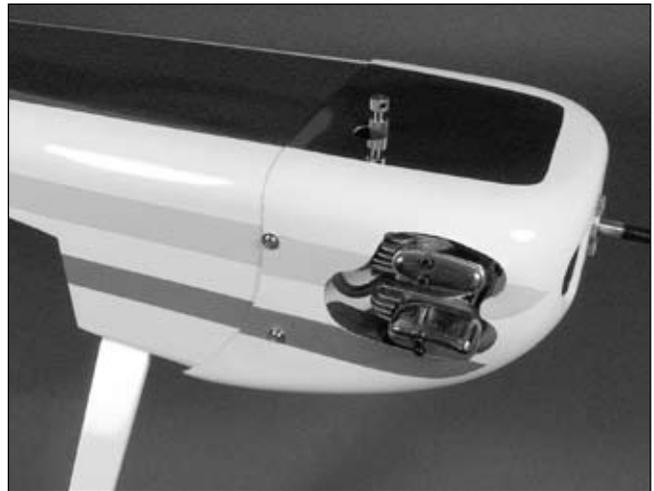
### □ Step 8

Remove a section of the cowl bottom to allow air to escape the cowling.



### □ Step 9

Attach the cowl using four #2 x 1/2" sheet metal screws.



### □ Step 10

Attach the propeller and spinner onto the engine.

# Section 8: Servo Installation

## Required Parts

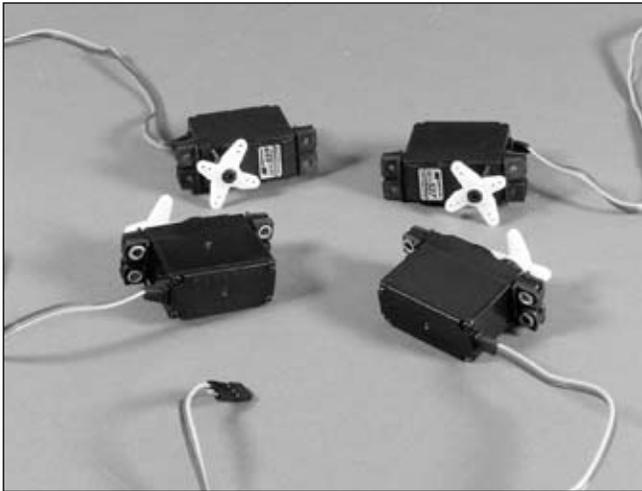
- Fuselage assembly
- Wing assembly
- Servo w/hardware (4)

## Required Tools and Adhesives

- Drill
- Drill bit: 1/16" (1.5mm), 3/32" (2.5mm)
- Phillips screwdriver (small)

### Step 1

Install the recommended servo hardware (grommets and eyelets) supplied with your radio system onto four servos (elevator, rudder and aileron (2)).



### Step 2

Temporarily install the rudder servo.

### Step 3

Mark the locations for the servo screws using a felt-tipped pen. Remove the servo and drill the holes for the servo mounting screws using a 1/16" (1.5mm) drill bit.



**Cool Tip:** Place a drop of thin CA onto each screw hole to harden the wood around the hole. Allow the CA to fully cure before installing the servos.

### Step 4

Attach an 18" (457mm) servo extension onto the rudder servo. Use your favorite method to secure the extension to prevent it from coming loose during flight. Secure the rudder servo using the screws provided with the servo.



### Step 5

Repeat Steps 1 through 4 for the elevator servo.



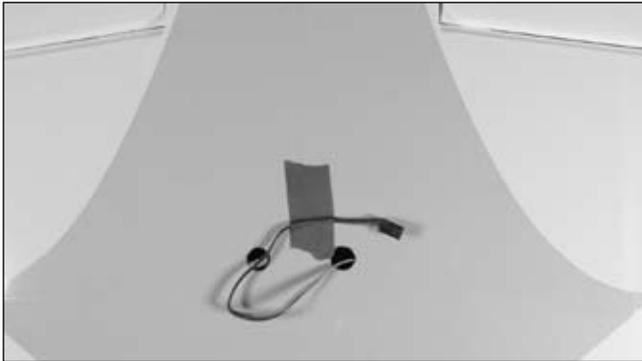
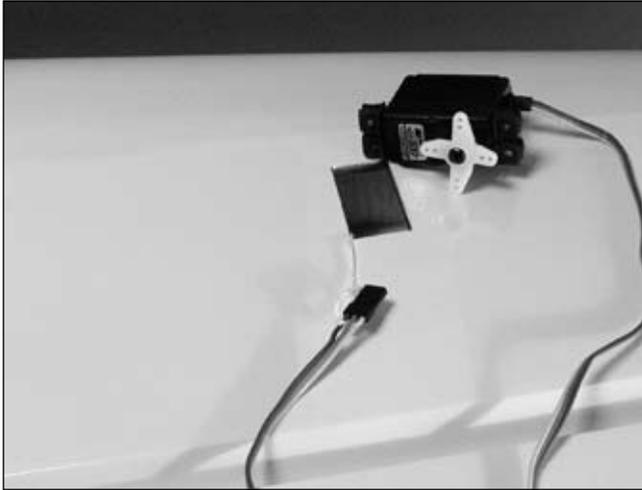
### Step 6

Temporarily install the aileron servo and mark the locations for the servo screws using a felt-tipped pen. Remove the servo and drill the holes for the servo mounting screws using a 1/16" (1.5mm) drill bit.

## Section 8: Servo Installation

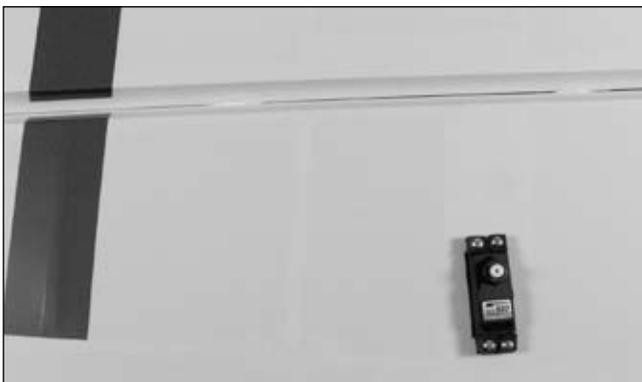
### □ □ Step 7

Attach a 9" (229mm) servo extension to the aileron servo. Tie the string inside the wing onto the servo extension. Gently pull the extension through the wing using the string. Untie the string when the servo lead has been pulled through. Use tape to secure the servo lead to the wing to prevent it from falling back into the wing panel.



### □ □ Step 8

Secure the servo using the hardware provided with the servo. The output shaft of the servo faces towards the trailing edge of the wing.

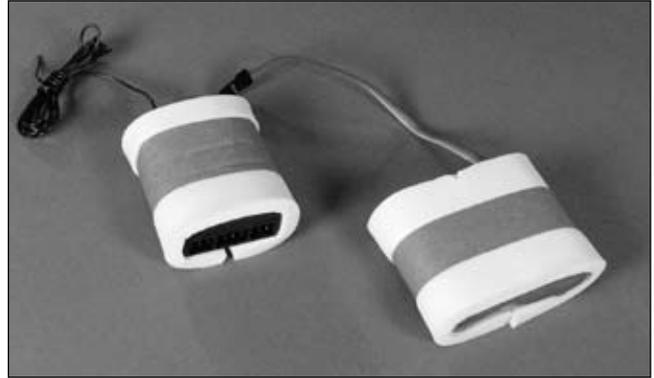


### □ Step 9

Repeat Steps 6 through 8 for the other aileron servo.

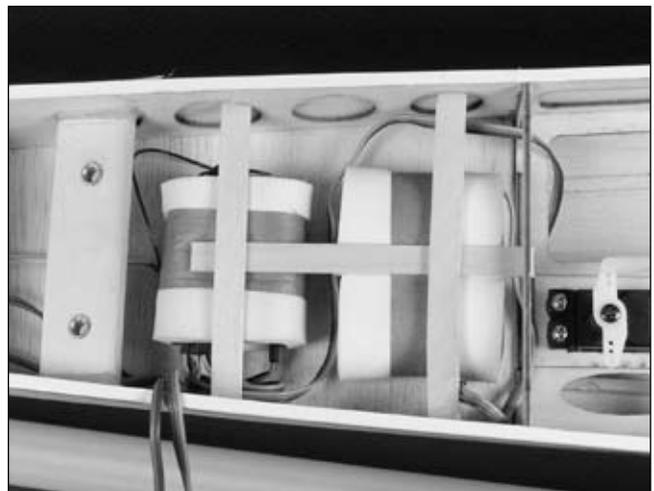
### □ Step 10

Wrap the receiver and receiver battery in protective foam to prevent damage that may be caused by engine vibration.



### □ Step 11

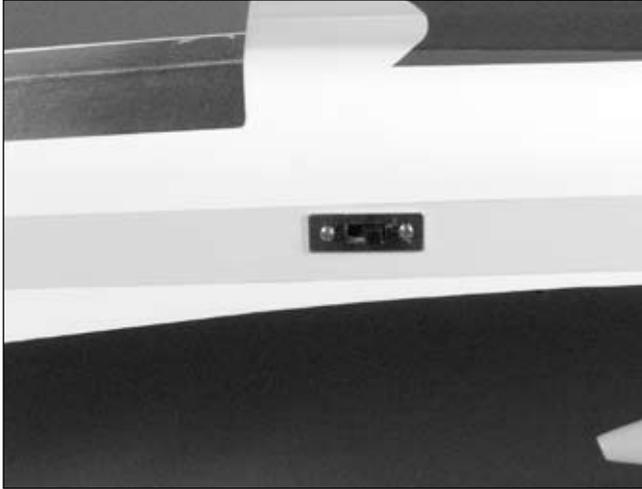
Temporarily mount the receiver and battery into the fuselage. It may be necessary to relocate the battery forward or aft to balance the model as described in the section "Control Throws and Center of Gravity." Plug in any servo leads or extensions at this time.



## Section 8: Servo Installation

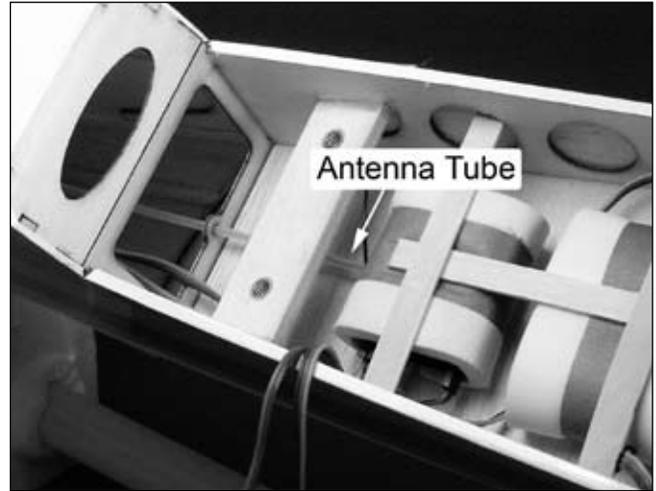
### Step 12

Mount the radio switch in the side of the fuselage.



### Step 13

Route the antenna to the rear of the fuselage using the preinstalled antenna tube.



## Section 9: Linkage Installation

### Required Parts

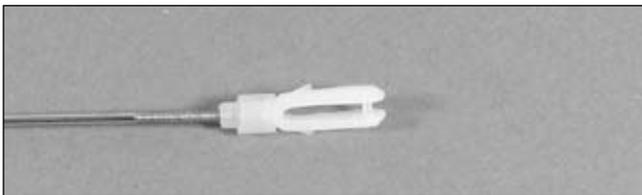
- Fuselage assembly
- Wing assembly
- Nylon clevis w/retainer (4)
- Nylon wire keeper (4)
- 2-56 x 1/2" screw (6)
- Nylon control horn (4)
- Heavy-Duty Servo Arm (JRPA215) (4)
- 7 7/8" (200mm) pushrod wire (4)
- #2 x 3/4" sheet metal screw (6)

### Required Tools and Adhesives

- Drill
- Drill bit: 1/16" (1.5mm), 3/32" (2.5mm)
- Phillips screwdriver (small)

### Step 1

Slide a clevis retainer onto a nylon clevis. Thread a clevis onto a 7 7/8" (200mm) wire a minimum of 10 turns.



### Step 2

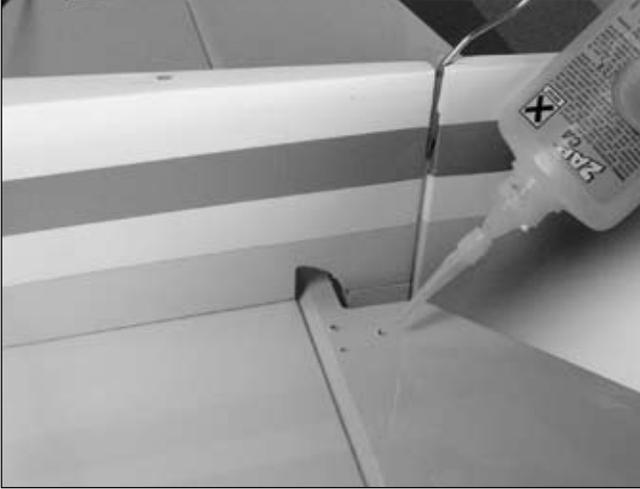
Attach a heavy-duty servo arm (JRPA215) to the elevator servo. Remove the back plate from a control horn using side cutters or a sharp hobby knife. Attach the clevis to the outer hole of the control horn. Position the control horn on the elevator so the horn aligns with the hinge line of the elevator. The pushrod should be parallel to the outside of the fuselage when the pushrod rests on the servo arm. Mark the position for the mounting holes using a felt-tipped pen.



## Section 8: Servo Installation

### □ □ Step 3

Drill three 3/32" (2.5mm) holes through the elevator at the locations marked in the previous step. Place 2–3 drops of thin CA into the hole to harden the wood. Repeat this for each of the three holes.



### □ □ Step 4

Attach the control horn using three 2-56 x 1/2" screws and the control back plate.



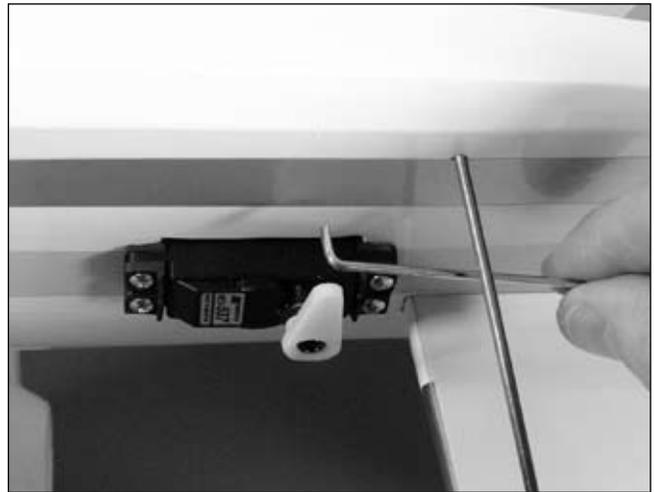
### □ □ Step 5

Physically place the elevator control surface in neutral. Mark the pushrod where it crosses the holes in the servo arm.



### □ □ Step 6

Bend the wire 90 degrees at the mark made in the previous step. Cut the wire 1/2" (13mm) above the bend.



## Section 8: Servo Installation

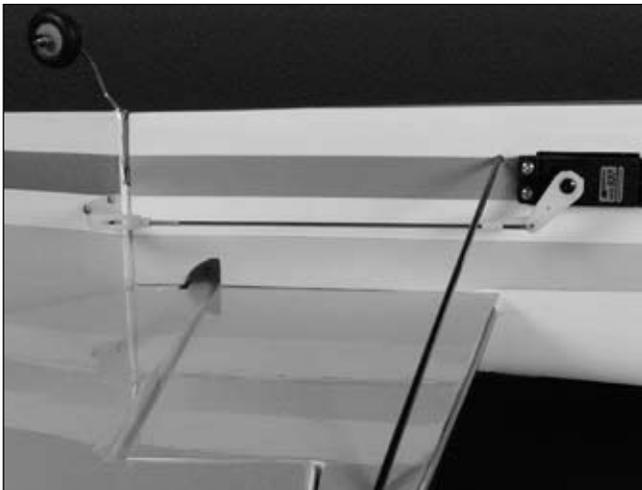
### □ □ Step 7

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



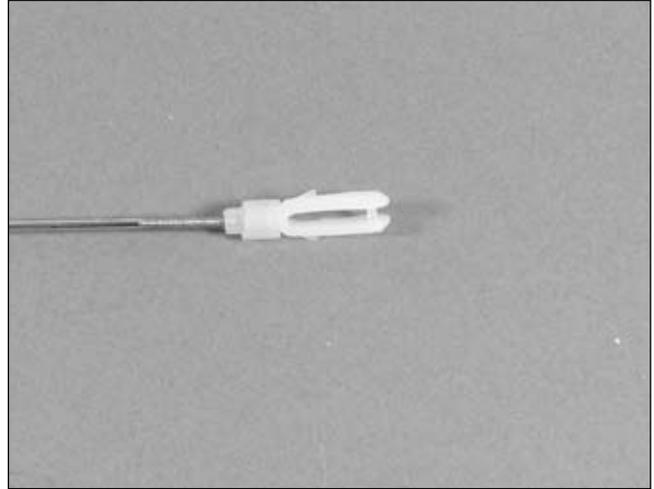
### □ Step 8

Repeat Steps 1 through 7 for the rudder linkage. Before marking the location of the control horn, use the radio to deflect the rudder servo to its full throw. The pushrod will be parallel to the stabilizer for the correct geometry.



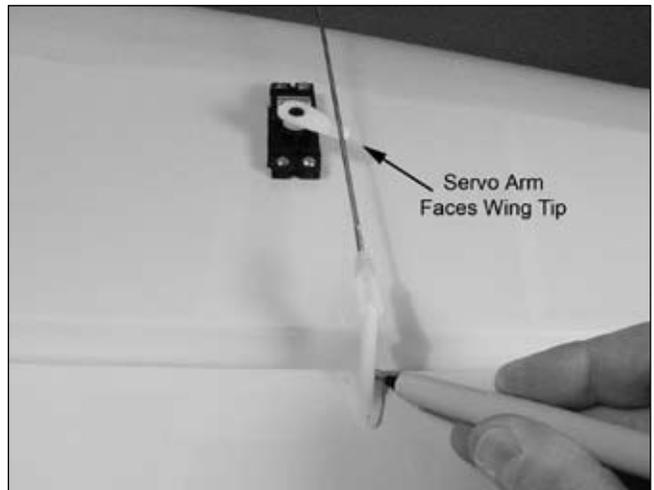
### □ □ Step 9

Slide a clevis retainer onto a nylon clevis. Thread a clevis onto a  $7\frac{7}{8}$ " (200mm) wire a minimum of 10 turns.



### □ □ Step 10

Remove the back plate from a control horn using side cutters or a sharp hobby knife. Attach the clevis to the control horn. After installing a heavy-duty servo arm, position the control horn on the aileron so the horn aligns with the hinge line of the aileron. With the aileron servo deflected for full throw, position the pushrod so it is perpendicular to the hinge line as it crosses the servo arm. Mark the position for the mounting holes using a felt-tipped pen.



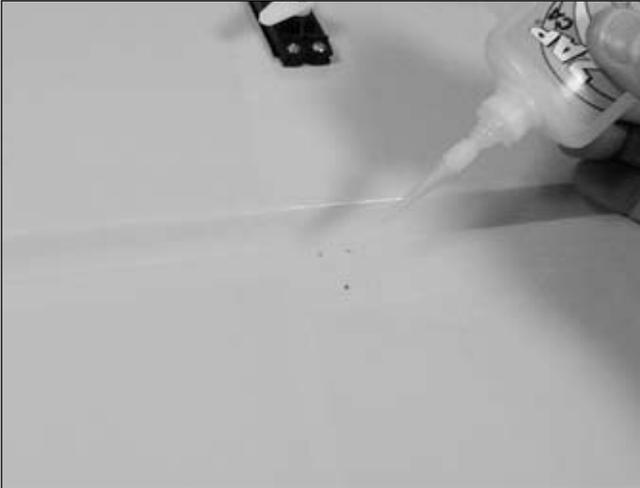
### □ □ Step 11

Drill three  $1/16$ " (1.5mm) holes at the locations marked in the previous step. The holes only need to be  $3/4$ " (19mm) deep: don't drill through the top of the aileron.

## Section 8: Servo Installation

### □ □ Step 12

Install one of the #2 x 3/4" screws in a hole drilled, and then remove it. Place 2–3 drops of thin CA into the hole to harden the wood. This will eliminate the potential of the screw pulling out of the wood. Repeat this for each of the three holes.



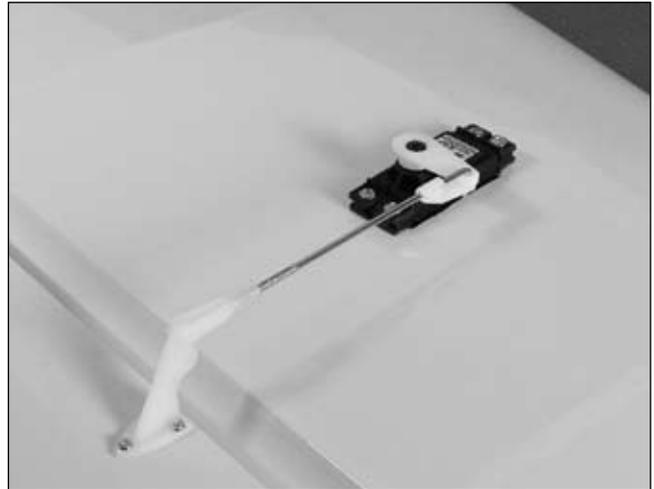
### □ □ Step 13

Attach the control horn using three #2 x 3/4" screws.



### □ □ Step 14

Center the aileron servo electronically using the radio system. Install a servo arm onto the aileron servo. Attach the pushrod with clevis to the control horn. Physically place the aileron control surface in neutral. Mark the pushrod where it crosses the holes in the servo arm. Bend the wire 90 degrees at the mark made in the previous step. Cut the wire 1/2" (13mm) above the bend. Slide the wire through the outer hole in the aileron servo arm. Secure the wire using a nylon wire keeper.



### □ Step 15

Repeat Steps 9 through 14 for the other aileron servo.

# Section 10: Final Assembly

## Required Parts

- Fuselage assembly
- Wing assembly
- Slide force generator (2)
- Canopy
- 4-40 x 1/2" socket head screw (6)

## Required Tools and Adhesives

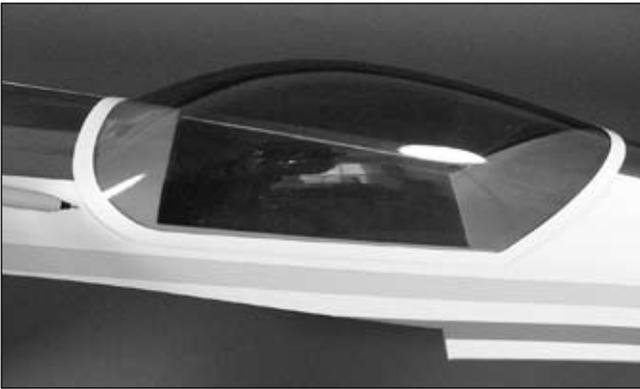
- Sandpaper (medium grit)
- Canopy glue
- Paper towel
- Rubbing alcohol

### Step 1

Install a pilot of your choosing. Use epoxy or Zap-A-Dap-A-Goo to secure the pilot.

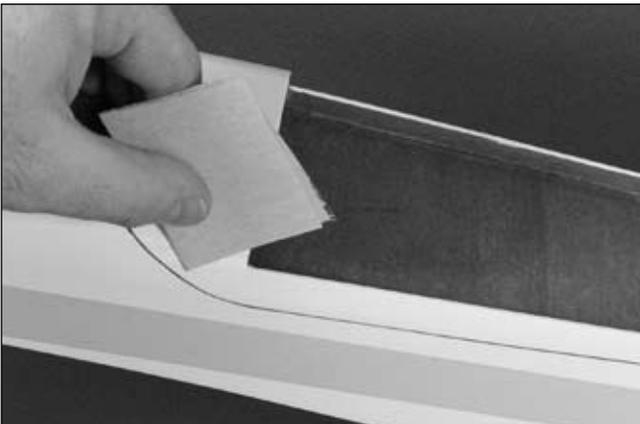
### Step 2

Position the canopy onto the fuselage. Trace around the canopy and onto the hatch using a felt-tipped pen.



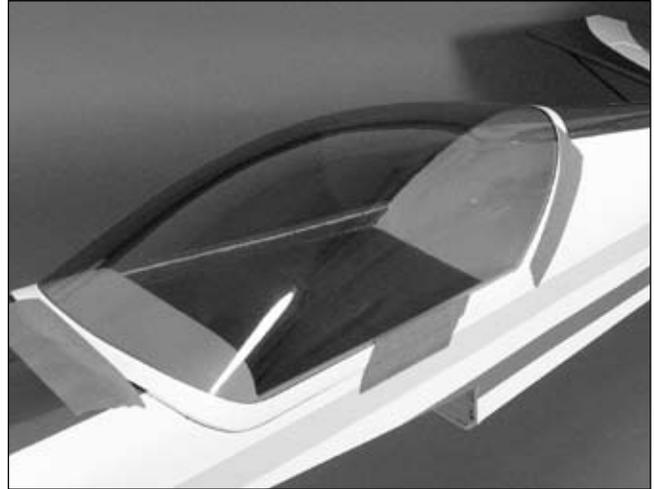
### Step 3

Lightly sand the inside edge of the canopy and slightly inside the line drawn on the hatch using medium sandpaper. Clean both the canopy and fuselage using a paper towel and rubbing alcohol. Be careful not to remove the line from the fuselage.



### Step 4

Apply a bead of Canopy Glue around the inside edge of the canopy. Position the canopy onto the hatch. Use tape to hold the canopy secure until the glue fully cures.

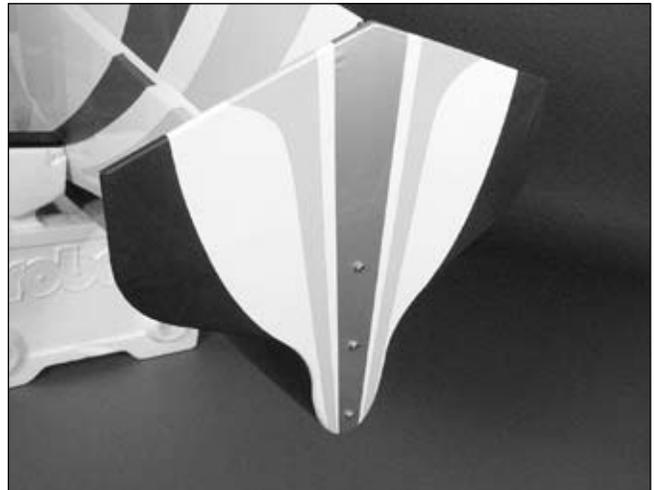


### Step 5

Once the canopy glue has fully cured use a paper towel and rubbing alcohol to remove the lines from the fuselage. Apply the decals. Use the photos on the box to aid in their location.

### Step 6

Attach the side force generators to the wing tips using three 4-40 x 1/2" socket head screws.



**Note:** The side force generators can be removed in a few seconds. Try your FuntanaX 50 with and without them to decide which setup suits your flying style best.

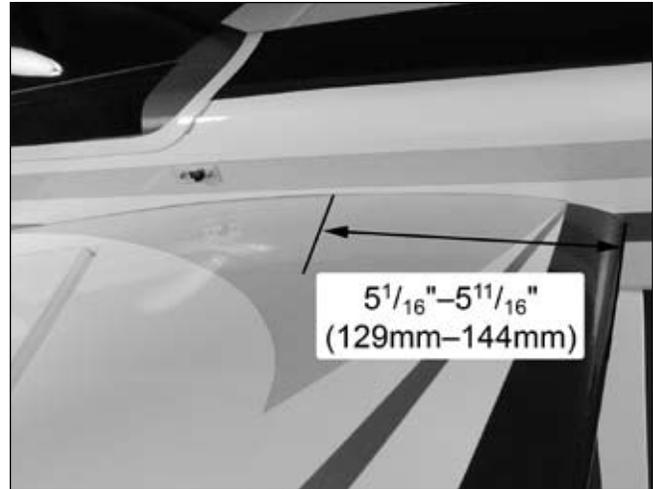
# Center of Gravity

## Recommended CG Location

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

### Caution: Do not inadvertently skip this step!

The recommended Center of Gravity (CG) range for the FuntanaX 50 is  $5 \frac{1}{16}$ "– $5 \frac{11}{16}$ " (129mm–144mm) behind the leading edge of the wing measured at the fuselage sides. If necessary, move the battery pack or add weight to either the nose or the tail until the correct balance is achieved. Stick-on weights are available at your local hobby shop and work well for this purpose.



# Recommended Control Throws

The following control throws offer a good place to start with your first flights. We recommend only one rate setting for the FuntanaX 50. As you become more familiar with the handling of your model, you may wish to add a second rate setting.

## Low Rates:

Aileron	3/4"	(19mm)	(9°)	up
	5/8"	(16mm)	(6°)	down

Elevator	7/8"	(23mm)	(11°)	up
	7/8"	(23mm)	(11°)	down

Rudder	2"	(51mm)	(25°)	left
	2"	(51mm)	(25°)	right

## 3D Rates:

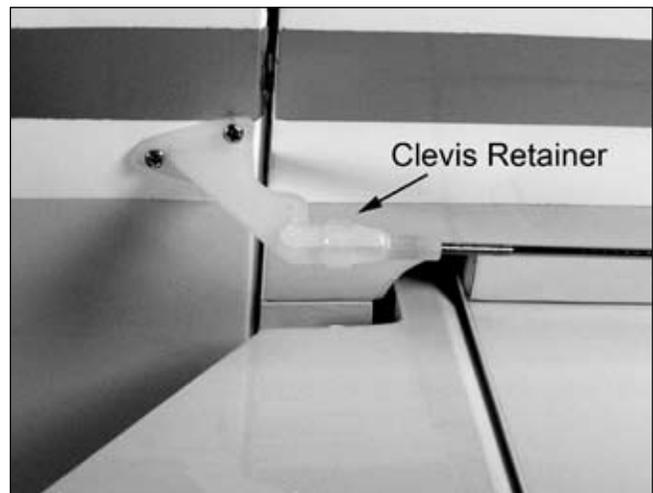
Aileron	2 1/8"	(54mm)	(27°)	up
	1 7/8"	(48mm)	(23°)	down

Elevator	2 5/8"	(67mm)	(40°)	up
	2 5/8"	(67mm)	(40°)	down

Rudder	3 7/8"	(98mm)	(45°)	left
	3 7/8"	(98mm)	(45°)	right

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

Once the control throws have been set, slide the clevis retainers on each clevis to prevent them from opening during flight.



## Preflight at the Field

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Charge both the transmitter and receiver pack for your airplane. Use the recommended charger supplied with your particular radio system, following the instructions provided with the radio. In most cases, you should charge your radio the night before going out flying.

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

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

## Adjusting the Engine

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### Step 1

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

### Step 2

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

### Step 3

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

## Range Test the Radio

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Before each flying session, range check your radio. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the radio in your airplane. With your airplane on the ground, you should be able to walk 30 paces away from your airplane and still have complete control of all functions. If not, don't attempt to fly! Have your radio equipment checked out by the manufacturer.



# 2006 Official AMA National Model Aircraft Safety Code

## GENERAL

- 1) I will not fly my model aircraft in sanctioned events, air shows or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.
- 2) I will not fly my model higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.
- 3) Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.
- 4) The maximum takeoff weight of a model is 55 pounds, except models flown under Experimental Aircraft rules.
- 5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. (This does not apply to models while being flown indoors.)
- 6) I will not operate models with metal-bladed propellers or with gaseous boosts, in which gases other than air enter their internal combustion engine(s); nor will I operate models with extremely hazardous fuels such as those containing tetranitromethane or hydrazine.

- 7) I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind) including, but not limited to, rockets, explosive bombs dropped from models, smoke bombs, all explosive gases (such as hydrogen-filled balloons), or ground mounted devices launching a projectile. The only exceptions permitted are rockets flown in accordance with the National Model Rocketry Safety Code or those permanently attached (as per JATO use); also those items authorized for Air Show Team use as defined by AST Advisory Committee (document available from AMA HQ). In any case, models using rocket motors as a primary means of propulsion are limited to a maximum weight of 3.3 pounds and a G series motor. (A model aircraft is defined as an aircraft with or without engine, not able to carry a human being.)
- 8) I will not consume alcoholic beverages prior to, nor during, participation in any model operations.
- 9) Children under 6 years old are only allowed on the flight line as a pilot or while receiving flight instruction.

## RADIO CONTROL

- 1) I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.
- 2) I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.
- 3) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.
- 4) I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band frequencies.)

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- 5) Flying sites separated by three miles or more are considered safe from site-to site interference, even when both sites use the same frequencies. Any circumstances under three miles separation require a frequency management arrangement, which may be either an allocation of specific frequencies for each site or testing to determine that freedom from interference exists. Allocation plans or interference test reports shall be signed by the parties involved and provided to AMA Headquarters. Documents of agreement and reports may exist between (1) two or more AMA Chartered Clubs, (2) AMA clubs and individual AMA members not associated with AMA Clubs, or (3) two or more individual AMA members.
- 6) For Combat, distance between combat engagement line and spectator line will be 500 feet per cubic inch of engine displacement. (Example: .40 engine = 200 feet.); electric motors will be based on equivalent combustion engine size. Additional safety requirements will be per the RC Combat section of the current Competition Regulations.
- 7) At air shows or model flying demonstrations, a single straight line must be established, one side of which is for flying, with the other side for spectators.
- 8) With the exception of events flown under AMA Competition rules, after launch, except for pilots or helpers being used, no powered model may be flown closer than 25 feet to any person.
- 9) Under no circumstances may a pilot or other person touch a powered model in flight.

## **Organized RC Racing Event**

- 10) An RC racing event, whether or not an AMA Rule Book event, is one in which model aircraft compete in flight over a prescribed course with the objective of finishing the course faster to determine the winner.
- A. In every organized racing event in which contestants, callers and officials are on the course:
1. All officials, callers and contestants must properly wear helmets, which are OSHA, DOT, ANSI, SNELL or NOCSAE approved or comparable standard while on the racecourse.
  2. All officials will be off the course except for the starter and their assistant.
  3. "On the course" is defined to mean any area beyond the pilot/staging area where actual flying takes place.
- B. I will not fly my model aircraft in any organized racing event which does not comply with paragraph A above or which allows models over 20 pounds unless that competition event is AMA sanctioned.
- C. Distance from the pylon to the nearest spectator (line) will be in accordance with the current Competition Regulations under the RC Pylon Racing section for the specific event pending two or three pylon course layout.
- 11) RC night flying is limited to low-performance models (less than 100 mph). The models must be equipped with a lighting system that clearly defines the aircraft's attitude at all times.



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