HANGAR 9®

Edge 540

ASSEMBLY MANUAL

Specifications

Wingspan: ..... 97.5 in (2476.5mm)
Length: ..... 85 in (2159mm)
Wing Area: ..... 1730.6 sq in (111.65 sq dm)
Weight: ..... 22.5–25.5 lb (10.2 kg–11.5 kg)
Radio: ..... 4-channel w/8 servos
Engines: ..... 3.8–4.8 cu in

- Superior controllability and aerobatic flight characteristics
- Lightweight construction
- Designed by veteran TOC competitor Mike McConville
- 90% built 1/3-scale ARF
- Plug-in wings and stabilizers for easy transport and field assembly

Table of Contents

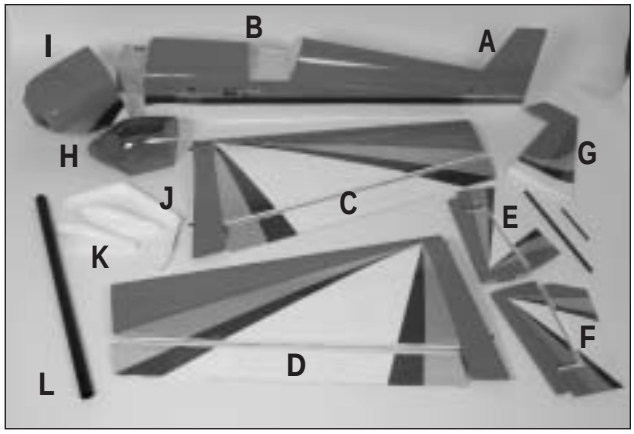
Using the Manual

This manual is divided into sections to help make assembly easier to understand and to provide breaks between each major section. Remember to take your time and follow the directions.

Covering Colors

- Flame Red HANU883
- Silver HANU881
- Pearl Blue HANU845
- White HANU870

Contents of Kit



Large Parts

A.	Fuselage w/Hatch	HAN1151
B.	Canopy Hatch	HAN1158
C.	Right Wing Panel w/Aileron	HAN1152
D.	Left Wing Panel w/Aileron	HAN1153
E.	Right Stabilizer w/Elevator	HAN1154
F.	Left Stabilizer w/Elevator	HAN1155
G.	Rudder	HAN1156
H.	Canopy	HAN1157
I.	Painted Cowl	HAN1159
J.	Carbon Fiber Landing Gear	HAN1160
K.	Wheel Pants	HAN1161
L.	Anodized Wing Tube	HAN1164

Items not shown:

Landing Gear Fairing	HAN1162
Decal Set	HAN1163
Anodized Stabilizer Tubes	HAN1165

Other Items Needed (not included in the kit)

- Propeller (consult engine instructions)
- 12" Servo Extension (JRPA098)
- 18" Servo Extensions (JRPA099) (3)
- 24" Servo Extensions (JRPA102) (5)
- Y-Harness (JRPA133) (2)
- MatchBox™ (JRPA900) (2)
- Zenoah® 2" Prop Drive (ZEN20004)(GT-80 only)

Additional Required Equipment

Radio Equipment

- 6-channel radio system (minimum)
- 1 standard servo for throttle (JRPS537 recommended or equivalent)
- 7 hi-torque servos (JRPS8411 recommended or equivalent)
- 1 hi-torque servo (JRPS8611 recommended or equivalent)

Recommended JR® Systems

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

JR PCM 10X

JR XP8103

Recommended Engines

- G-62, GT-80

Zenoah® G62
ZENE62A

Zenoah® GT-80
ZENE80T

Additional Required Tools and Adhesives

Tools

- 4-40 tap
- 8-32 tap
- Adjustable wrench (small)
- Canopy scissors
- Drill (drill press preferred)
- Drill bit: 1/16", 3/32", 7/32", 1/4", #43, 1/2", 5/32", 9/64"
- Drum sander
- Cut-off wheel
- Velcro straps
- Flat blade screwdriver w/short handle
- Foam: 1/2"
- Hex wrench: 3/32"
- Hobby knife
- Masking tape
- Phillips screwdriver (small)
- Pliers
- Scissors
- Square
- Syringe
- Tap handle
- Toothpicks

Adhesives

- 6-minute epoxy
- 30-minute epoxy
- Thick CA (cyanoacrylate) glue
- CA remover/debonder
- Pacer Z-42 Threadlock
- Formula 560-canopy glue
- Shoo Goo

Other Required Items

- Epoxy brushes
- Felt-tipped pen or pencil
- File
- Measuring device (e.g. ruler, tape measure)
- Mixing sticks for epoxy
- Paper towels
- Petroleum jelly
- Rubbing alcohol
- Sanding bar
- Sandpaper (coarse)
- Clear UltraCote® (HANU964)
- Covering Iron (HAN101)
- Dental floss or string

Additional Required Tools and Adhesives

Dura-Collars, 3/16"	(1)	DUB141
Axle Shafts, 3/16 x 2"	(1)	DUB249
Fuel Tank, 32oz	(1)	DUB690
Pro-Lite Wheels, 3-1/2"	(1)	HAN308
Titanium Pro-Links 4-40 x 2-1/2"	(1)	HAN3552
Titanium Pro-Links 4-40 x 3-1/2"	(1)	HAN3554
Titanium Pro-Links 4-40 x 4-1/2"	(1)	HAN3556
HD 1/2 Servo Arm 4-40: JR	(8)	HAN3574
3D XL 1/2 Servo Arm 4-40: JR	(1)	HAN3578
8-32 Swivel Clevis Horn	(4)	HAN3614
4-40 x 4-40 HD Ball Link	(5)	HAN3616
Tailwheel, Lg Haigh 12-22 lb	(1)	OHI160
Super Hinge Points	(4)	ROB309

Servo Selection

The servos used for the control surfaces of the Edge 540 must have a minimum of 80 ounce inch of servo torque. In the prototype edges, we used JR8411 servos. On the rudder we used ONE JR8611 servo. Two servos are recommended if using other servos on the rudder.

Before Starting Assembly

Before beginning the assembly of the Edge 540, remove each part from its bag for inspection. Closely inspect the fuselage, wing panels, rudder, and stabilizer for damage. If you find any damaged or missing parts, contact the place of purchase.

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

Warning

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

Warranty Information

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

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

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

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

Horizon Hobby
4105 Fieldstone Road
Champaign, Illinois 61822
(877) 504-0233
www.horizonhobby.com

Section 1 – Aileron Servo Installation

Required Parts

- Wing panel (right and left)

Required Tools and Adhesives

- Phillips screwdriver (small)
- Drill bit: 1/16"
- Drill
- 12" Servo Extension (JRPA098)
- 24" Servo Extension (JRPA102)

Step 1

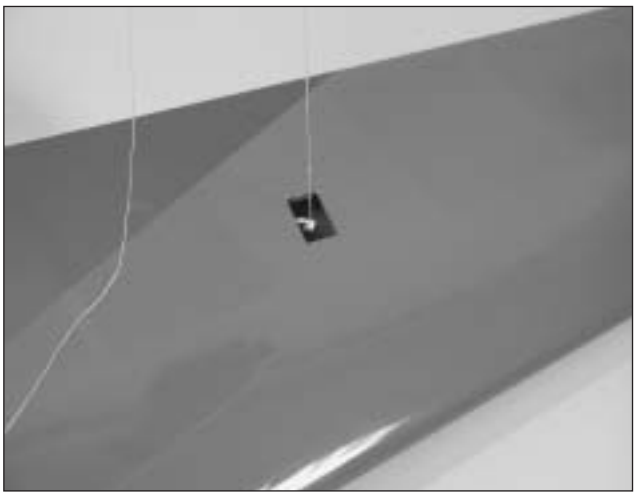
Install the servo hardware (grommets and eyelets) included with the servo.

Step 2

Plug a 12" and a 24" servo extension onto two of the servos. Either tie the servo leads together, using a commercially available connector, or use unwaxed dental floss to secure the extensions to prevent them from coming loose during flight.

Step 3

Tie a weight to a piece of string. A wheel collar works great in this application. Lower the string into the wing from the aileron servo opening. Let the weight drop out through the wing root for the servo.



Step 4

Insert the servo with the 24" extension towards the tip of the wing. Use the string to pull the servo lead through the wing. Position the servo so the output shaft is towards the trailing edge of the wing. Use a 1/16” drill bit to drill the locations for the servo screws. Mount the servos using the hardware provided with the servos.

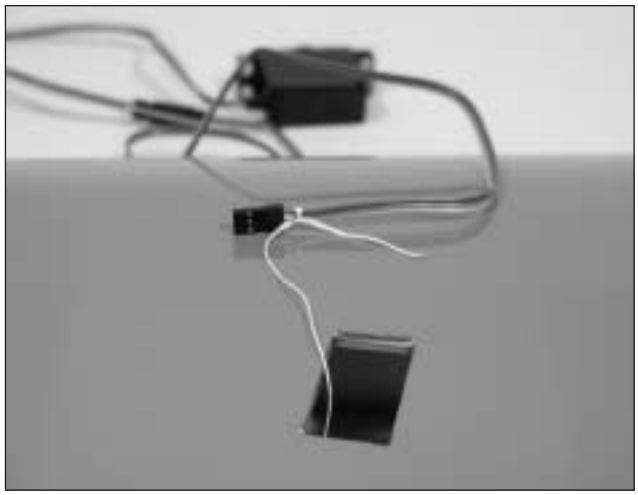


Photo for Step 4

Photo for Step 4

Step 5

Repeat Steps 3 and 4 for the servo near the root of the wing panel.

Step 6

Repeat Steps 1 through 5 for the remaining wing panel.

Section 2 – Aileron Control Horn Installation

Required Parts

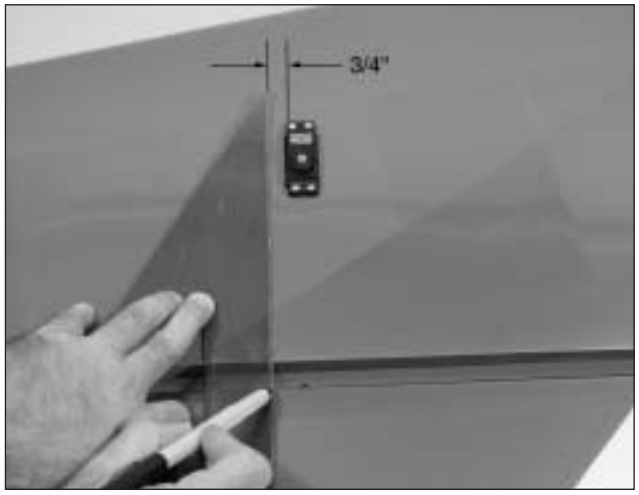
- Wing panel (left and right)
- Aileron (left and right)

Required Tools and Adhesives

- Felt-tipped pen
- 8-32 tap
- Square
- 30-minute epoxy
- Drill bit: 5/32"
- Tap handle
- Ruler
- Rubbing alcohol
- Drill (drill press preferred)
- 8-32 x 2" Hangar 9® control horn screw (4) (Included in HAN1220 (JR®) or HAN1221 (FUT))
- Hangar 9 control horn hex nut (4) (Included in HAN1220 (JR) or HAN1221 (FUT))

Step 1

Tape the aileron to the wing. Make a mark 3/4" away from the edge of the servo towards the tip of the wing. Using a square held in alignment (90°) with the mark and with the trailing edge, mark the aileron with a pen where the straight edge intersects the aileron hinge bevel.



Step 2

Measure exactly 3 1/2" forward from the trailing edge of the aileron and make another mark using a felt-tipped pen. The intersection of the line from Step 1 and this line will be the position for the control horn.

Step 3

Repeat Steps 1 and 2 for the second control horn location.

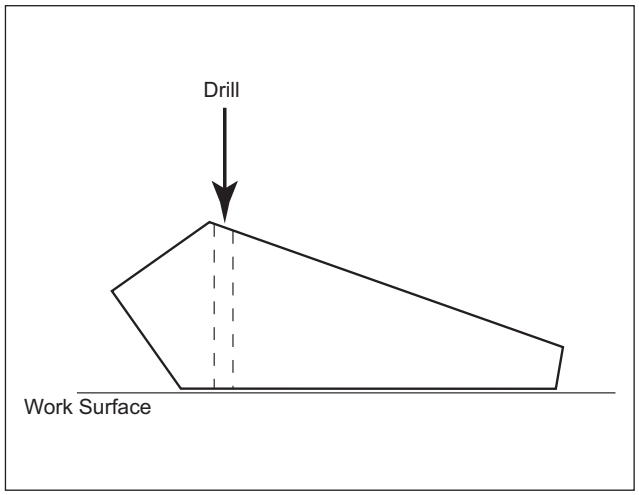
Step 4

Remove the ailerons from the wing. Use rubbing alcohol to remove any tape residue.

Step 5

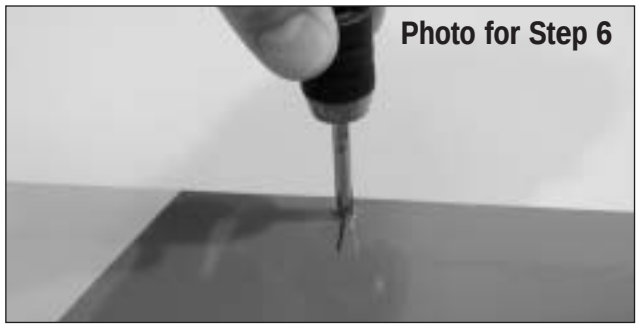
Using a 5/32" drill bit and drill press, carefully drill through the aileron at the marked position. Be especially careful when penetrating through the top surface of the aileron, as it's easy to split out the wood and rip the covering. Placing a wooden block under the aileron and drilling slowly will prevent these problems. If you choose to use the countersink screws included in the Hangar 9® Hardware Package, countersink the top of the aileron to allow the screws to fit flush.

Note: A hardwood block (hard point) is located below the sheeting; you will be drilling through this. Make sure to drill the hole perpendicular to the top of the aileron. It is highly recommended to use a drill press to achieve this.



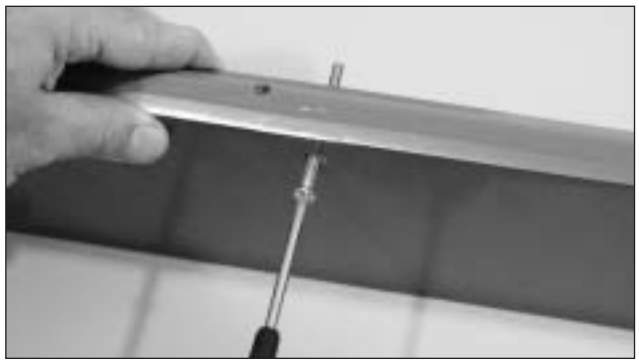
Step 6

Using an 8-32 tap, tap the hole just drilled in the aileron.



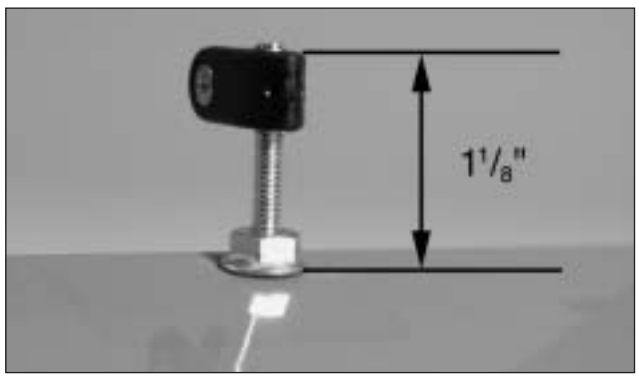
Step 7

Mix a small amount of 30-minute epoxy and lightly coat the inside of the tapped hole and the 8-32 x 2" Hangar 9® control horn screw. From the top of the aileron, screw the 8-32 x 2" into the tapped hole and securely tighten. Wipe away any excess epoxy with rubbing alcohol and a paper towel. Screw the hex nut in place as shown. Allow the epoxy to fully cure.



Step 8

Screw the molded swivel link onto the 8-32 screw until the distance from the aileron surface to the top of the link is 1 1/8".



Step 9

Repeat Steps 1 through 8 for the remaining aileron.

Section 3 – Hinging and Sealing the Control Surfaces

Required Parts

- Wing panel (right and left)
- Aileron (left and right)

Required Tools and Adhesives

- 30-minute epoxy
- Sandpaper (coarse)
- Robart hinge points
- Syringe
- Toothpicks

Properly hinging the control surfaces on giant-scale models is vitally important! Poorly installed hinges affect the model's precision and control response and can also be dangerous. Each and every hinge needs to be securely bonded in place in both the flying surface and the control surface. The hinge pivot points need to be exactly parallel to each other and precisely located on the center of the hinge line. We regularly use Robart Super Hinge Points in all giant-scale aircraft. They are easy to install, very strong, and offer smooth friction-free control. The Hangar 9® Edge 540 control surfaces are predrilled to use Robart's Super Hinge Points.

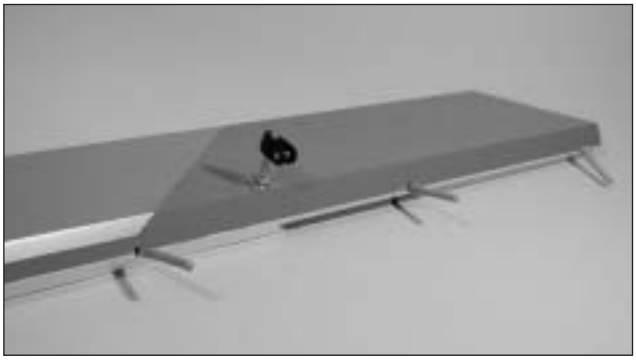
Step 1

Sand each end of the hinge point hinges using coarse sandpaper. This will improve the bond of the epoxy to the hinge.

Step 2

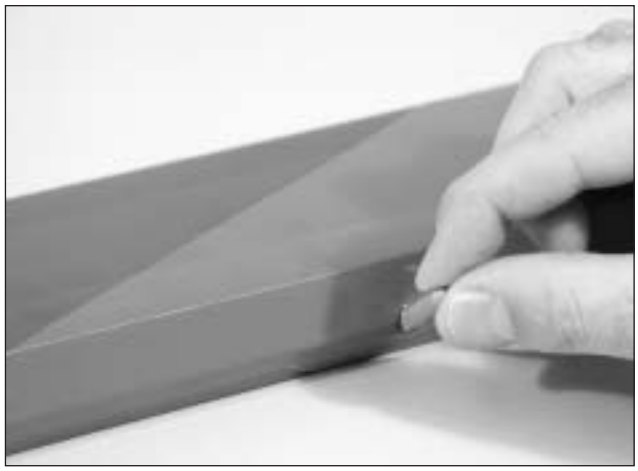
Mix 1 ounce of 30-minute epoxy. Using a glue syringe or toothpick, place a sufficient amount of 30-minute epoxy into one of the hinge pockets in the aileron leading edge. Install one of the hinge points until the hinge pin center is flush with the leading edge of the aileron. Some epoxy should ooze out of the pocket as the hinge is installed. If not, remove the hinge and apply more epoxy. After gluing a few hinges, you'll get the hang of just how much epoxy is needed. Wipe away any excess epoxy with rubbing alcohol. Recheck that the center of the hinge pin is flush and parallel with the leading edge. Continue installing hinges in the leading edge of the aileron. The control surfaces (ailerons) will be installed after the epoxy is fully cured.

> **Note**: Be sure that the hinge pivot pins are parallel and flush to the aileron leading edge. It's important to frequently mix a fresh batch of 30-minute epoxy in order to achieve good glue joint penetration. If you notice the epoxy becoming thicker, then mix a new batch!



Step 3

Allow the epoxy to fully cure for at least 6 hours. When cured, work each hinge throughout its full motion several times using your hands. This will break free any epoxy that may have found its way into the hinge joint. Move the hinge throughout its full travel until no resistance is felt. This may take as many as 40 or 50 times.

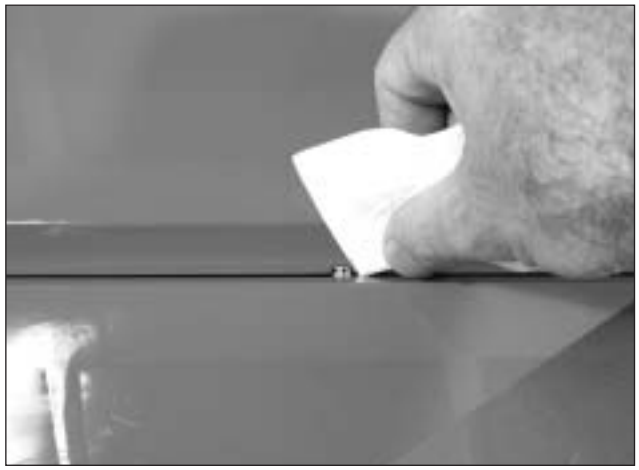


Step 4

Mix 1 ounce of 30-minute epoxy. Using a syringe or toothpick, place a sufficient amount of epoxy in each of the hinge pockets in one wing panel.

Step 5

Carefully attach the aileron to the wing, making sure the hinges are inserted in their respective hinge pockets. Press the aileron and wing together such that less than a 1/64" hinge line gap exists between the aileron and wing. The bevels should virtually touch. Use a paper towel and rubbing alcohol to wipe away any visible epoxy around the hinges.



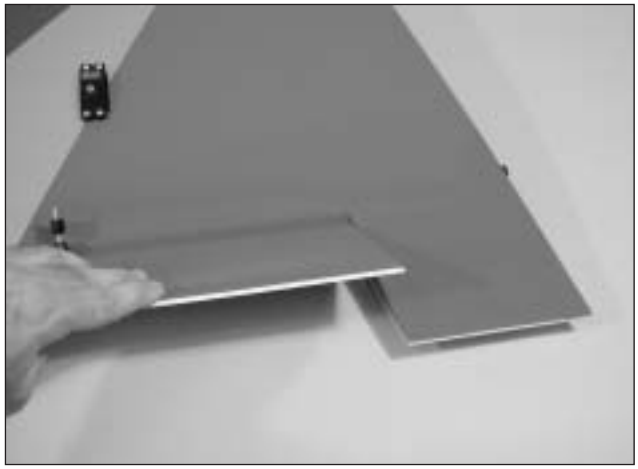
Step 6

Double-check the hinge gap and allow the epoxy to fully cure for at least 6 hours. Now is a good time to repeat Steps 1 through 5 for the remaining wing panel and aileron.

Section 3 – Hinging and Sealing the Control Surfaces

Step 7

When fully cured, move each control surface throughout its travel range several times to break away any epoxy in the hinge. Be sure to deflect the surface fully.



Section 4 – Sealing the Hinge Gaps

Required Parts

- Wing panel (right and left)
- Aileron (left and right)

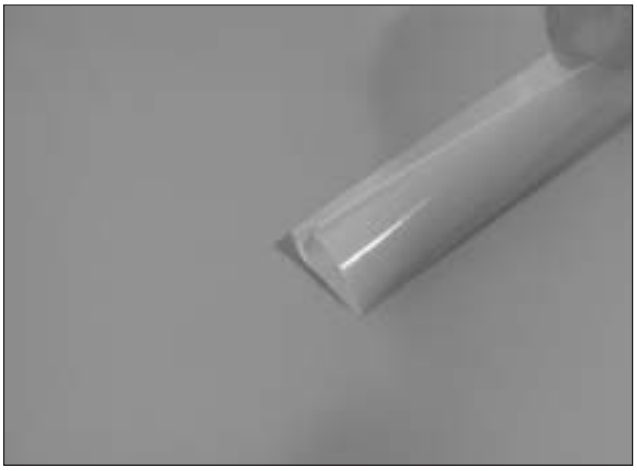
Required Tools and Adhesives

- Straight edge/ruler
- Scissors
- Clear UltraCote® (HANU964)
- Covering Iron (HAN101)
- Felt-tipped pen
- Hobby knife w/#11 blade

It's imperative that the aileron and elevator hinge lines be sealed airtight to prevent flutter. Sealing the hinge line has several advantages. A sealed hinge line gives a greater control response for a given control deflection. It also offers more precise, consistent control response and makes trimming easier. Sealing the aileron and elevator hinge line is mandatory. Failure to do so may cause control surface flutter, resulting in a crash.

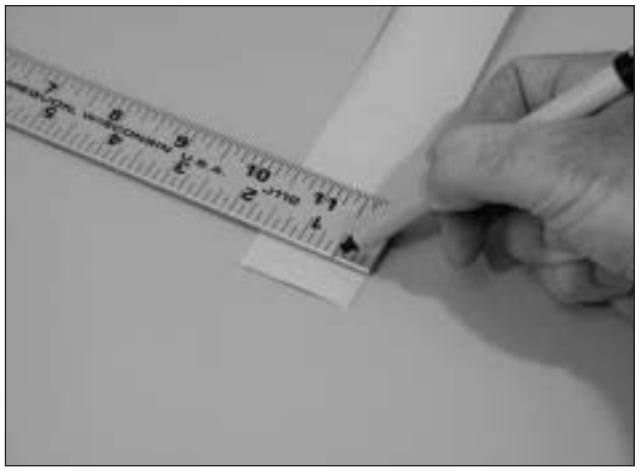
Step 1

Cut a piece of Clear UltraCote (not included) for sealing the ailerons to approximately 3" x 42". Fold the UltraCote down the center with the adhesive side to the outside making a sharp crease at the fold.



Step 2

Using a ruler, measure 1/2" from the folded crease and mark two places with a felt-tipped pen.

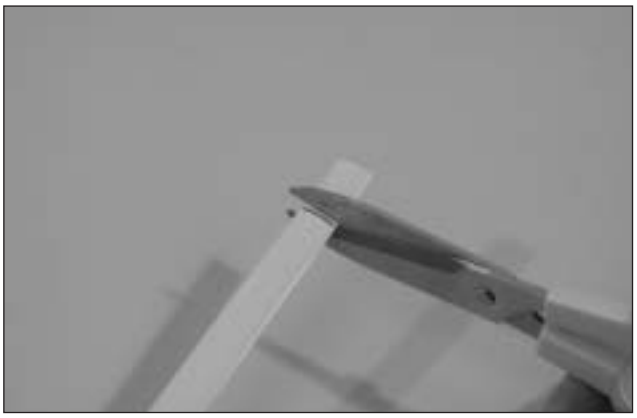


Step 3

Using a sharp #11 blade and a straight edge, carefully cut through both layers of UltraCote® covering at the 1/2" point marked in Step 2.

Step 4

Mark and cut the folded covering to an overall length of 42". This piece will be inserted and ironed down into the hinge bevel on the bottom of the aileron.



Step 5

Remove the backing from the UltraCote. Place the folded crease side into the center of the hinge line on the bottom of the wing. Using a straight edge as shown, hold one side of the covering in place while ironing down the opposite side with a sealing iron. We recommend setting the iron temperature to 320° for this procedure.

Step 6

Fully deflect the aileron in the up position. Place the straight edge over the hinge line covering that you just ironed down in Step 5 with the edge of the straight edge placed firmly at the bottom of the hinge line as shown. Iron down this side of the covering, making sure the aileron is fully deflected.

Section 5 – Aileron Linkage Installation

Required Parts

- Aluminum servo arms (4)
- Control horn ball ends (4)
- 4 1/2" 4-40 linkage (4)

Required Tools and Adhesives

- Phillips screwdriver (small)
- Threadlock

MatchBox Option: To simplify the installation of the aileron servo linkages, you may want to use the JR™ MatchBox™ servo matching/power system (JRPA900). Four MatchBoxes would be used in this application—one for each wing panel, one for the rudder and one for the elevator servo configuration. The MatchBox allows easy adjustment of the servo's center and endpoints, making radio setup a snap. You can also use a separate battery to run the MatchBox, reducing the load on the flight battery powering the receiver.

Step 1

Screw a 4-40 ball link 5 to 6 turns onto each end of a 4 1/2" long 4-40 linkage. Adjust the linkage length until the hole in the ball link aligns with the outer hole in the servo arm when the aileron is neutral and the servo arm is centered.

Note: Hangar 9® Titanium Pro-Links feature right-hand threads on one end and left-hand threads on the other, allowing for easy, accurate adjustment without disconnecting the linkages. Consistently putting the right-hand threads toward the servo arms on all servos will prevent you from getting confused as to which way to turn the linkage to lengthen or shorten the link. Hangar 9 also offers a Pro-Link™ Wrench (HAN3558) to make adjustments easier.

Step 2

Using the 4-40 screws (don't substitute a standard screw) and nuts included in the Hangar 9 package, attach the ball link to the outer hole in the arm from the bottom side as shown. The sequence is screw, tapered standoff, ball link, servo arm and nut. Don't forget to use threadlock.

Step 3

Attach the servo horn to the servo using the screw provided with the servo.

Step 4

Attach the linkage to the servo horn on the aileron. Adjust the link so the aileron is centered at the same time as the servo.

Photo for Step 4

Step 5

Repeat Steps 1 through 4 for the second servo.

Step 6

Repeat Steps 1 through 5 for the remaining servos in the opposite wing panel.

Section 6 – Wing Installation

Required Parts

- Wing panels
- Fuselage
- Wing tube
- 1/4-20 x 2" nylon bolts (2)

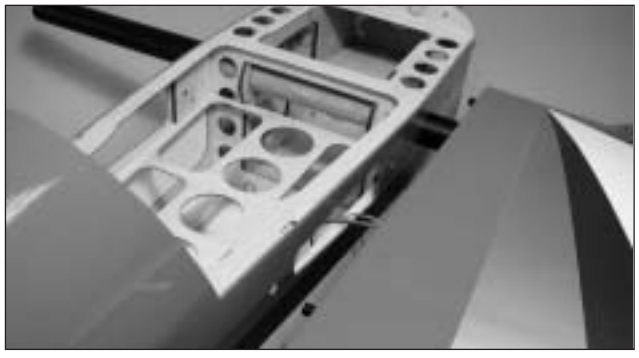
Required Tools and Adhesives

- Flat screwdriver w/short handle
- Thick CA
- Sandpaper (medium)

Step 1

Be sure the anti-rotation pins are secure in the wing halves before installing the wings. If they are not, remove the pin and lightly sand the pins using medium-grit sandpaper. Apply a small amount of thick CA into the tube socket and reinstall the pin.Locate the wing tube and carefully slide it into one wing panel. Slide the wing (with tube) into the wing tube opening in the fuselage. Make sure the wing panel anti-rotation pins slide into the holes provided in the fuselage.

> **Note**: It may be necessary to slightly enlarge the holes in the fuselage for the anti-rotation pins using a small round file.



Step 2

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

Step 3

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

Section 7 – Elevator Assembly

Required Parts

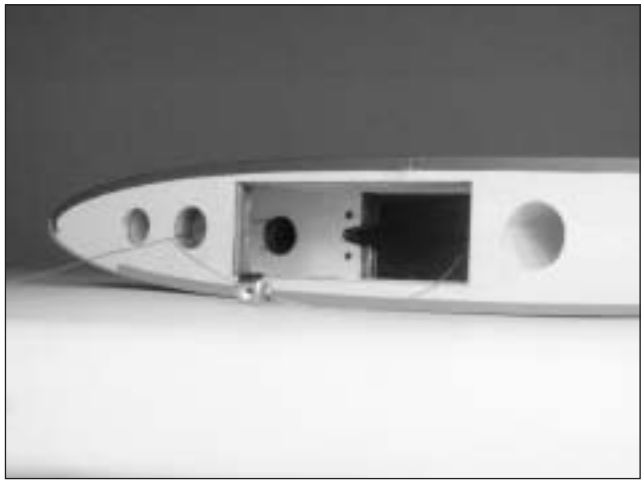
- Stabilizer (right and left)
- Fuselage
- Stabilizer tube (small)
- Stabilizer tube (large)

Required Tools and Adhesives

- String
- Small weight
- Control horn (2)
- Robart hinge points
- Phillips screwdriver
- Servo w/hardware (2)

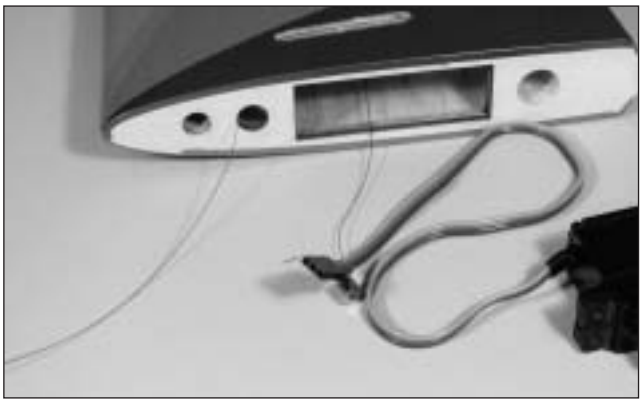
Step 1

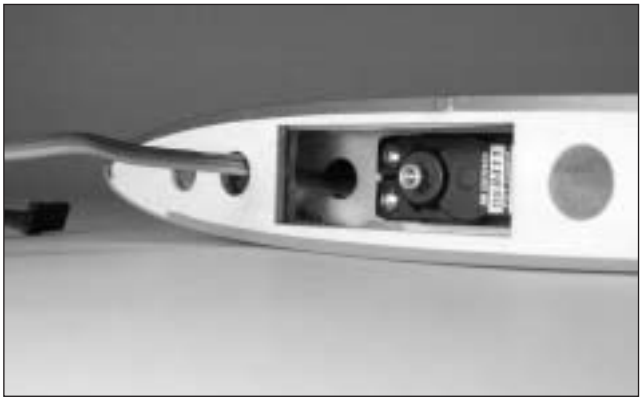
Pass a string with a small weight through the two holes in the stabilizer. The string then passes back out the opening for the servo.



Step 2

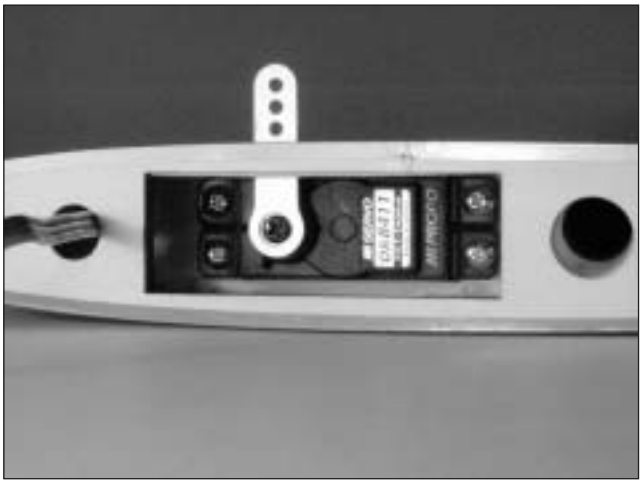
Tie the string around the servo lead. Pull the servo lead through the openings in the stabilizer. Install the servo using the hardware provided with the servo.





Step 3

Center the elevator servo using the radio system. Install a servo arm onto the servo.

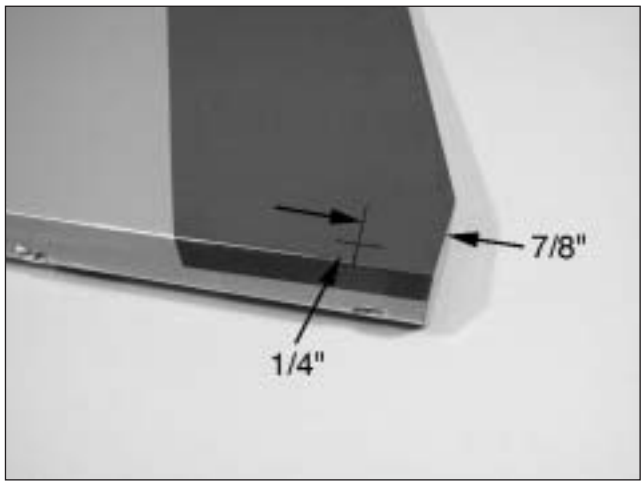


Section 7 – Elevator Assembly

Note: The technique for installing the control horns in the elevators is similar to the aileron control horn installation.

Step 4

To properly locate the position of the control horn on the bottom of the elevator, measure inward 7/8" from the root and rearward 1/4" from the top of the bevel.



Step 5

Using a 5/32" drill bit and drill press, carefully drill through the elevator at the above marked position. It's important to drill 90° to the top of the elevator. Be especially careful when penetrating through the bottom surface of the elevator, as it's easy to split out the wood and rip the covering. Placing a wooden block under the elevator and drilling slowly will prevent these problems. If you choose to use the countersunk screws included, countersink the holes in the top of the elevator to allow the screws to fit flush.

Step 6

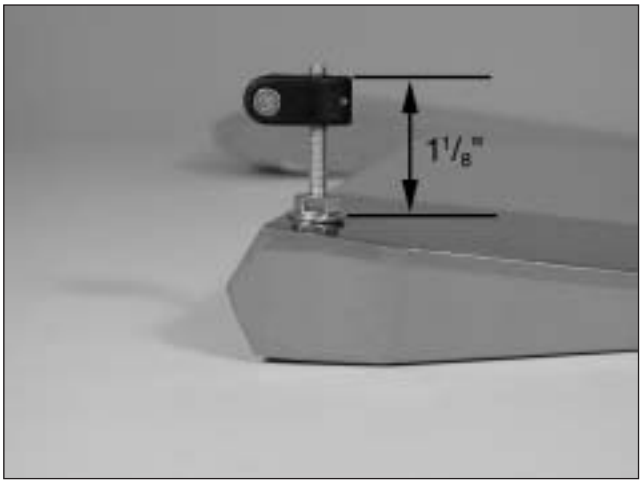
Use an 8-32 tap to thread the holes just drilled in the elevator.

Step 7

Mix a small amount of 30-minute epoxy and lightly coat the inside of the threaded holes and the 8-32 x 2" Hangar 9® screw. From the top of the elevator, thread the 8-32 screws into the tapped holes and tighten. Wipe away any excess epoxy with rubbing alcohol and paper towels.

Step 8

Screw the molded swivel link onto the 8-32 screw until the distance from the elevator surface to the bottom of the link is 1 1/8".

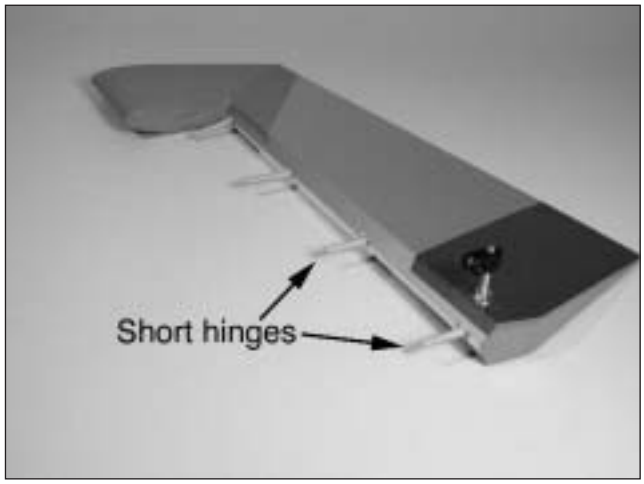


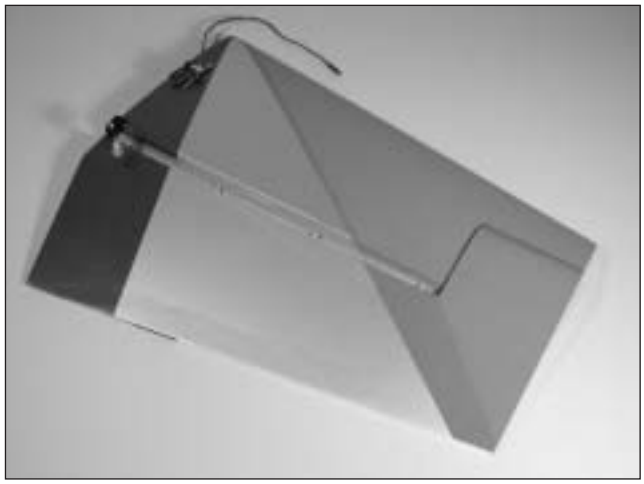
Step 9

Cut off the first section of two of the hinges. This is done to clear the tube installed in the elevator.

Step 10

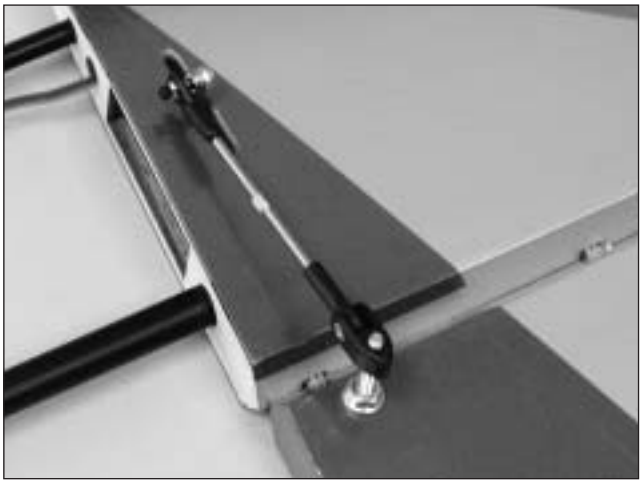
Glue the elevator hinges in place using the same techniques used to hinge the ailerons. The shortened hinges will be installed into the stabilizer towards the root. After hinging the elevator, use the same technique to seal the elevator's hinge gaps. Use Clear UltraCote® for the bottom of the elevator.





Step 11

Assemble and install the elevator linkage using a 2 1/2" titanium linkage.

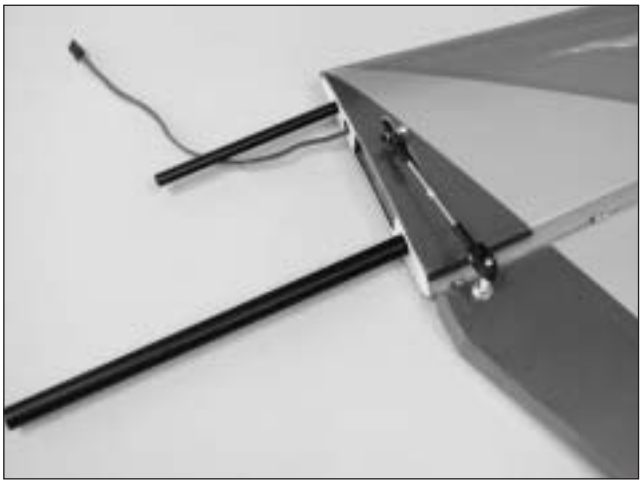


Step 12

Repeat Steps 1 through 11 for the remaining stabilizer and elevator.

Step 13

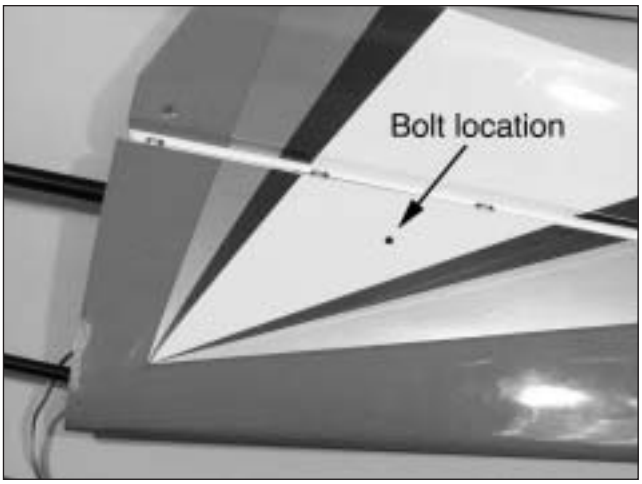
Insert the stabilizer tubes into one half of the stabilizer. The small tube is located at the leading edge of the stabilizer.



Section 7 – Elevator Assembly

Step 14

Drill through the hole in the stabilizer and tap for a 4-40 bolt. Install the bolt to secure the tube.



Step 15

Slide the stabilizer onto the fuselage.

Step 16

Slide the remaining stabilizer onto the tubes and against the fuselage. Drill and tap the location for the 4-40 retaining bolt. Install the bolt to complete the procedure.

Section 8 – Rudder Assembly

Required Parts

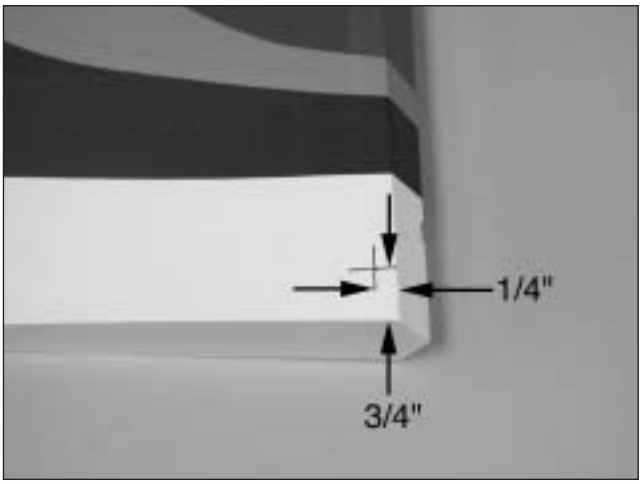
- Rudder
- Fuselage

Required Tools and Adhesives

- Phillips screwdriver
- Servo w/hardware
- Control horn
- Robart hinge points

Step 1

Mark the position for the rudder control horn with a pen. The correct location is 3/4" up from the bottom of the rudder and 1/4" rearward from the edge of the rudder bevel.



Step 2

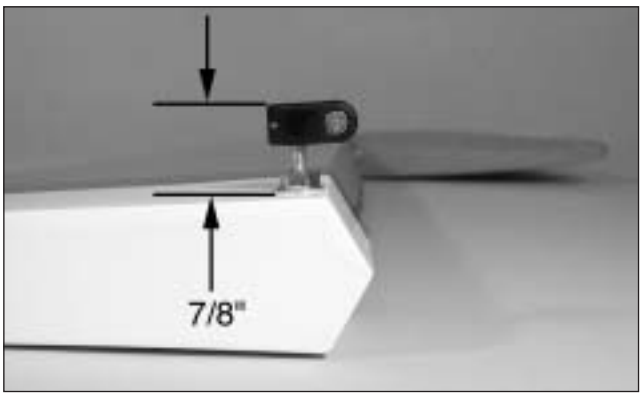
Using a 5/32" drill bit and drill press, carefully drill a 5/32" hole through the rudder, perpendicular (90°) to the rudder centerline at the marked position. Be especially careful when penetrating through the backside of the rudder.

Step 3

Using an 8-32 tap, thread the hole that you just drilled in the rudder. Countersink the hole on the side that will be opposite the rudder servo.

Step 4

Thread a hex nut (included with swivel clevis) onto the threaded rod and securely tighten against the rudder. Screw a molded swivel link onto the threaded rod so the top of the link is 7/8" from the surface of the rudder.

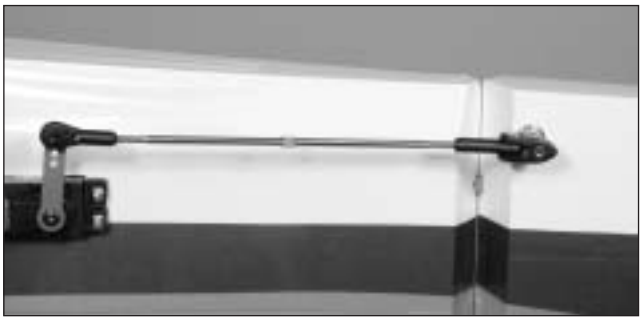


Step 5

Hinge the rudder using the same technique as with the aileron and elevator.

Step 6

Remove the stock servo arms and replace them with heavy-duty 1 1/4" arms. Assemble the rudder control linkage using a 5" titanium linkage and ball ends.



Step 7

If you are using two rudder servos there is an opening opposite the one shown in the photos. Remove the covering from the opening and repeat Steps 1 through 6 to install the second rudder servo. You will also have to use a threaded rod in Step 1 instead of the single bolt to have connections on both sides of the rudder for the linkages.

Section 9 – Landing Gear Installation

Required Parts

- Fuselage
- Landing gear fairing
- 10-32 x 1" socket head bolt (4)
- 10-32 nylon lock nut (4)
- #10 lock washer (4)
- 1/4-20 x 2” nylon bolt

Required Tools and Adhesives

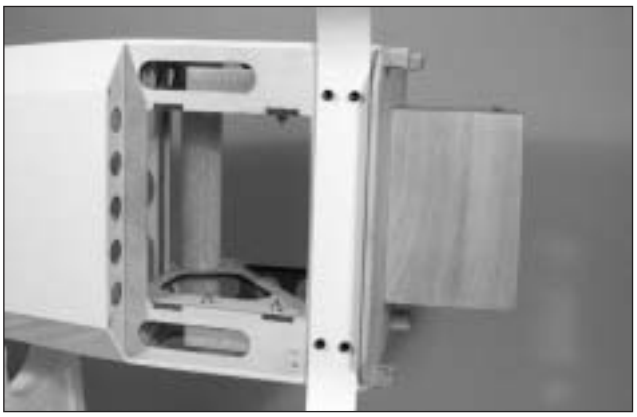
- Hobby knife
- 5/32" hex wrench
- Adjustable wrench (small)

Step 1

Install the axles in the landing gear. Secure the axles using an adjustable wrench and the nuts provided with the axles.

Step 2

Install the landing gear using four 10-32 x 1" socket head bolts, four #10 lock washers and four 10-32 nylon lock nuts. (The lock nuts are placed inside the fuselage.)



Step 3

Attach the landing gear fairing using two 4-40 x 3/4" bolts and two #4 washers.

Section 10 – Wheel Pant Installation

Required Parts

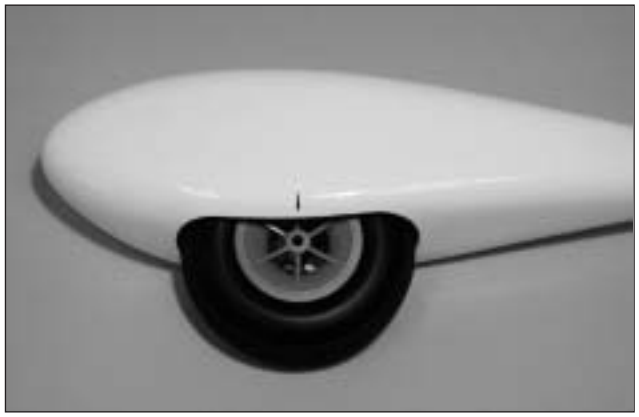
- Wheel (2)
- #4 washer (2)
- Fuselage w/landing gear
- Wheel pant (left and right)
- 4-40 x 1/2" socket head screw (2)
- 3/16" wheel collar (4)
- #4 lock washer (2)

Required Tools and Adhesives

- Drill
- Felt-tipped pen
- Ruler
- Drill bit: 1/2" and 9/64"
- Square

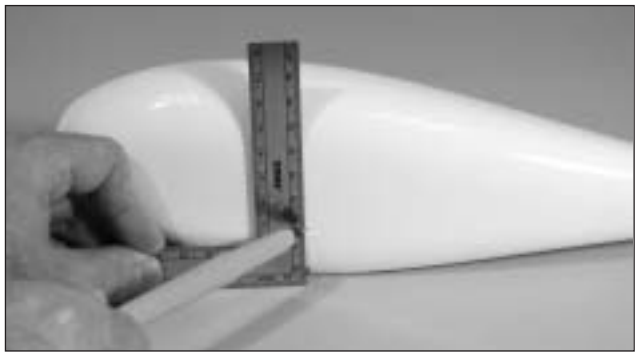
Step 1

Center a wheel in the opening of the wheel pant. Use a felt-tipped pen to mark the location of the hole for the axle on the pant. Make sure you are marking the side that has the plywood reinforcement.



Step 2

Place the pant on a flat surface and use a square to draw a $1^{1}/_{2}$" line through the mark made in the previous step. Mark the wheel pant 3/4" from the surface for the location of the axle.



Step 3

Use a rotary tool or drill to make a 1/2" hole at the location made in the last step.

> **Note**: When using drill bits, it is best to start small and work up to the larger size bit.

Step 4

Fit the pants over the axle on the landing gear. Align the wheel pant parallel to the fuselage centerline. Use a felt-tipped pen to transfer the location of the holes onto the pant.

Section 10 – Wheel Pant Installation

Step 5

Remove the pant and use a 9/64" drill bit to drill the location marked in the previous step.

Step 6

Install a 4-40 blind nut into the hole from the inside of the pant. The nut will be drawn into the plywood later in this section.

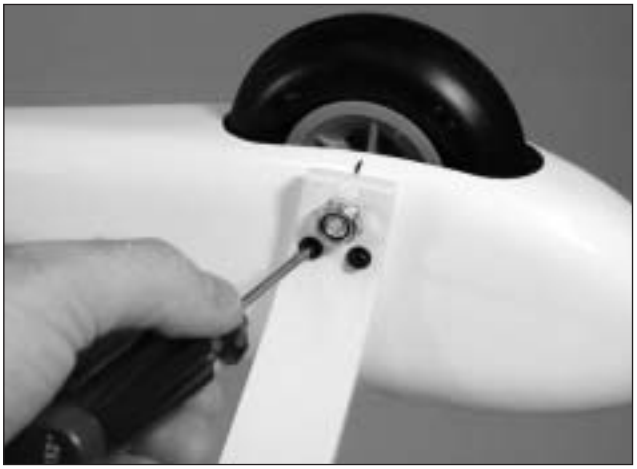
Step 7

Install the following items onto the axle: wheel pant, 3/16" wheel collar, wheel then another 3/16" wheel collar. It will be necessary to fit the parts inside the wheel pant and slide them onto the axle.

> **Note**: It may be necessary to drill the hole in the wheel to fit onto the axle.

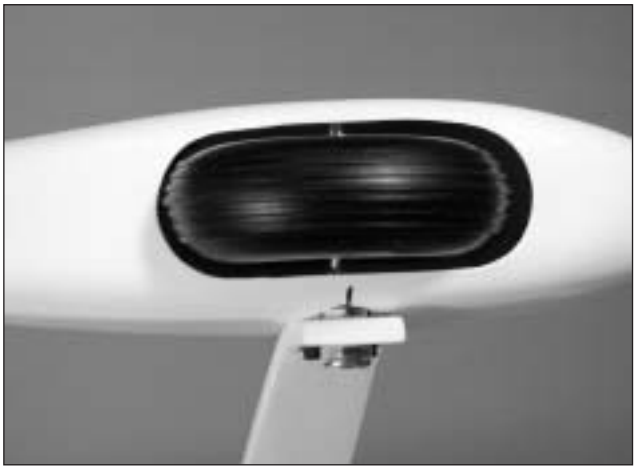
Step 7

Secure the pant in place using a 4-40 x 1/2" socket head screw, #4 lock washer, and #4 washer. Use threadlock on the screw to prevent it from coming loose in flight.



Step 8

Center the wheel in the wheel pant and tighten the collars to prevent the wheel from moving side to side. Use threadlock on both set screws.



Step 9

Repeat Steps 1 through 8 for the remaining wheel pant.

Section 11 – Tail Wheel Installation

Required Parts

- Fuselage
- Tail wheel assembly

Required Tools and Adhesives

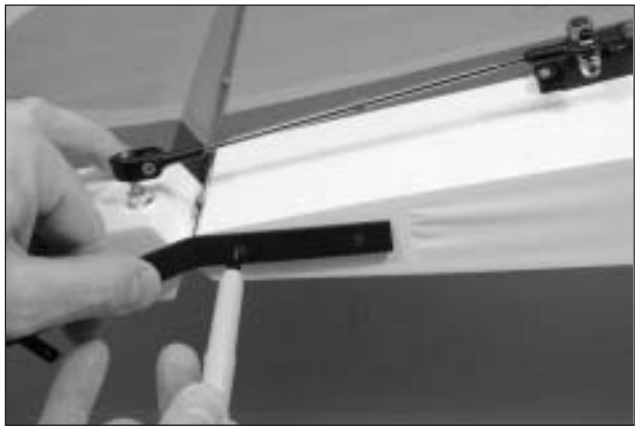
- Drill
- Drill bit: 3/32"
- #6 x 3/4" screw (2) (not included)
- Felt-tipped pen

Step 1

Assemble the tail wheel per the instructions included with the tail wheel assembly. The nylon control horns included with the tail wheel assembly are not used.

Step 2

Position the tail wheel in place as shown, centered on the rear of the fuselage. Using a felt-tipped pen, mark the positions for the mounting screws through the tail wheel bracket.



Step 3

Remove the bracket and drill 3/32" pilot holes at the previously marked positions.

Step 4

Use two #6 x 3/4" sheet metal screws to secure the tail wheel bracket in place. A hardwood plate is positioned in the rear of the fuselage, allowing these screws to be firmly tightened.

> **Hint**: Remove the #6 x 3/4" screws and wick thin CA into the holes to strengthen the threads. When dry, reinstall the screws.

Tip: Use 1/8" plywood to make a bracket to attach the springs to the rudder. Using the provided spring, hook up the tiller arm to the rudder per the instructions included with the tail wheel.

Section 12 – Receiver, Battery and Fuel Tank Installation

Required Parts

- Fuselage

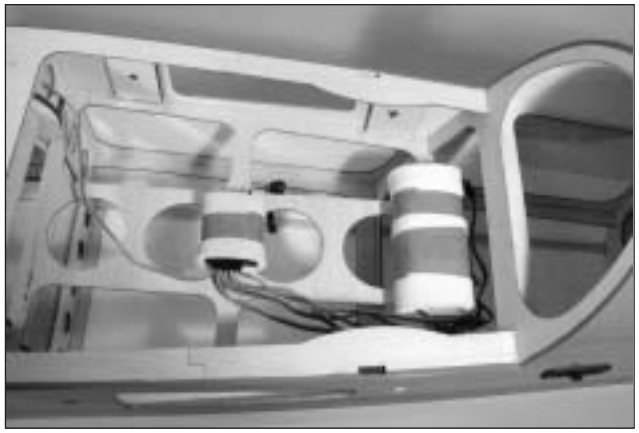
Required Tools and Adhesives

- 1/8" light plywood
- Velcro straps
- 6-minute epoxy

Step 1

Use foam and rubber bands (or Velcro® straps) to secure the receiver to the battery tray.

> **Note**: We have also mounted MatchBoxes for the rudder and elevator servos next to the receiver.



Step 2

If using the Zenoah® GT80, it will be necessary to mount the battery pack slightly near the wing's trailing edge to properly balance the model. The lighter weight Zenoah G62 requires that the battery be mounted in the nose.

Step 3

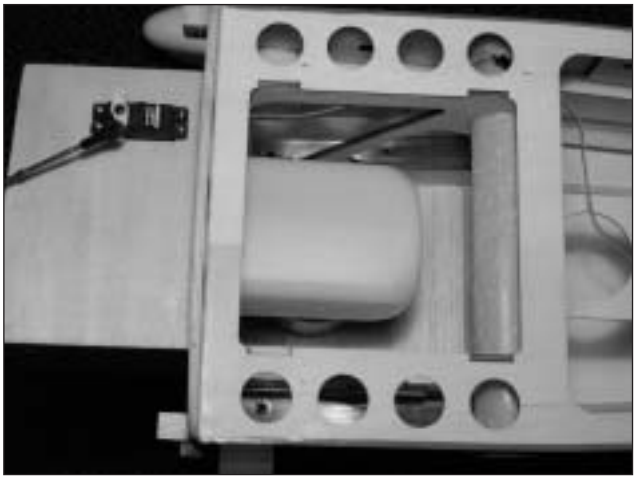
Wrap the receiver battery in foam and use rubber bands or Velcro straps to secure the battery to the battery tray. Use 6-minute epoxy to attach the battery tray in the fuselage in the correct location for your engine selection.

Step 4

Assemble the tank per the instructions included with the tank. Be sure to use the gas-compatible stopper and fuel tubing.

Step 5

Place foam on the floor of the tank compartment. Secure the tank in place by wrapping rubber bands or Velcro straps around the tank and tank floor. Cup hooks can be used to hook the rubber bands to the tank floor. Later we will run the fuel lines.



Step 6

Mount the receiver switch in a convenient location in the side of the fuselage.

Section 13 – Mounting the Engine and Cowl

Required Parts

- Fuselage assembly
- 1/4" lock washer (4)
- Fuel Filler (HAN115)
- Kill Switch (ZEN20000)
- 4-40 x 12" threaded rod (2)
- Engine mounting adapter plate (G62 only)
- 1/4-20 x 1 1/2" socket head cap screw (4) (G62)
- Cup engine Mount (B&B6202) (G62)
- 1/4-20 x 1/2" socket head cap screw (4) (GT80)
- 2' Gas-Compatible Fuel Tubing (DUB800)
- 18" Servo Extension (JRPA099)
- Engine
- 4-40 Ball Links
- 1/8" plywood

Required Tools and Adhesives

- Rotary tool
- Drum sander
- Drill bit: 1/16"
- Phillips screwdriver
- Cut-off wheel
- Drill
- Hobby knife w/#11 blade

The Hangar 9® Edge 540 accepts gas engines ranging from 60 through 80cc. The prototype Edges were flown using Zenoah® G62s and Zenoah GT80s. The G62 offers good sport performance and is a good choice for doing all IMAC basic and sportsman maneuvers. While the G62-equipped Edge doesn't quite provide unlimited vertical performance, most experienced sport flyers find that the G62 offers plenty of power for all but the most aggressive types of aerobatics.

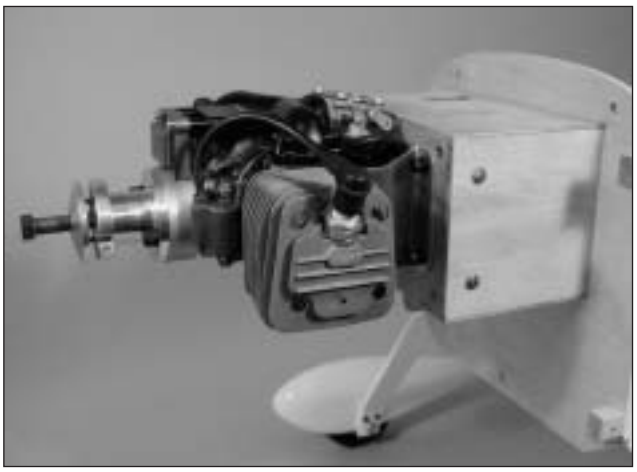
If you're a 3D fanatic or an Advanced or Unlimited IMAC class competitor, Zenoah's GT80 offers power for more extreme vertical maneuvers.

> **Note**: Before beginning this section, remove the standard GT-80 prop drive and replace with the 2" prop drive (ZEN20004).

GT80 Installation

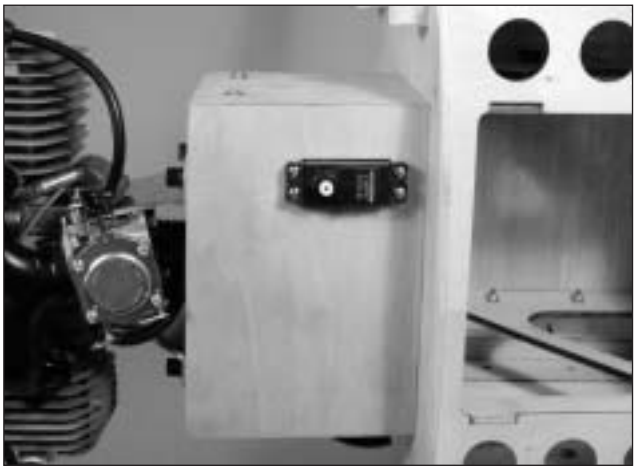
Step 1

Fit the engine to the firewall using four 1/4-20 x 1/2" socket head screws, split washers and blind nuts provided.



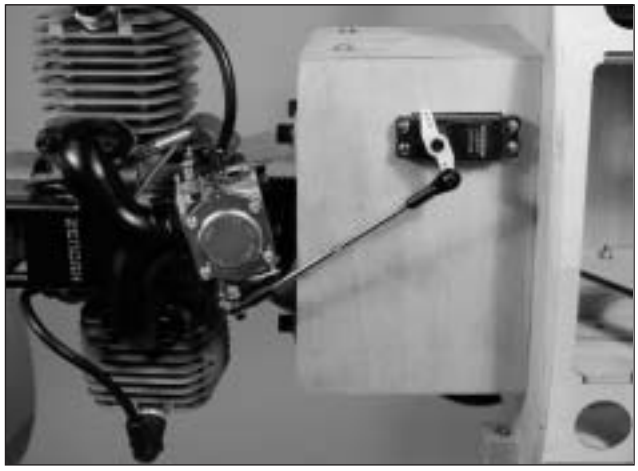
Step 2

The GT80 throttle servo is positioned as shown in the top of the engine box. Mount the servo using the hardware supplied with the servo.



Step 3

Make up the throttle linkage using a 4-40 rod and two ball links. Carefully tap the throttle arm of the carburetor with a 4-40 tap and connect the ball link to the throttle arm. Use the remaining ball end to attach the linkage to the servo arm.



Step 4

Attach a 4-40 rod with a ball link to the choke lever. Route the linkage to the bottom of the fuselage where it can be easily accessed during the starting of the engine.

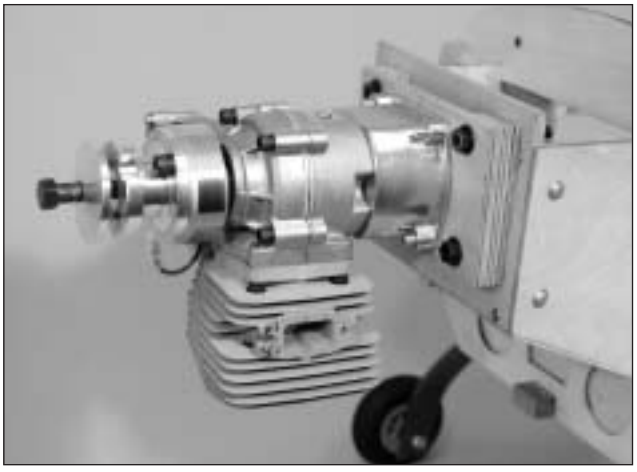
G62 Installation

Step 1

Remove the metal engine mount (if attached) from the G62. Attach the B+B Cup engine mount. Attach the cup mount to the adapter plate using the hardware supplied with the cup mount.

Step 2

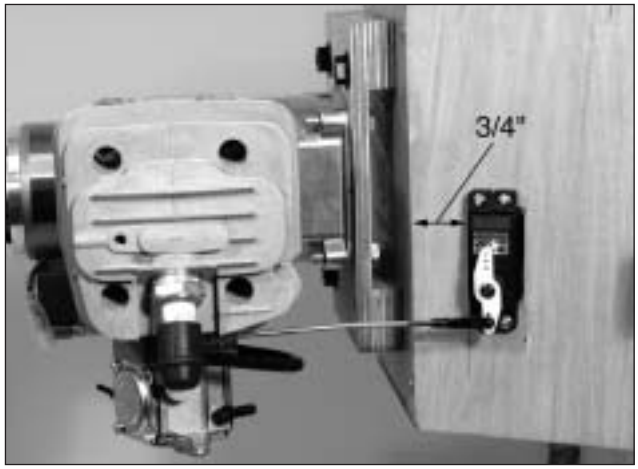
Install the adapter plate and engine to the firewall using 1/4-20 x 1 1/2" socket head screws (not included), split washers and blind nuts.



Section 13 – Mounting the Engine and Cowl

Step 3

Mount the throttle servo on the bottom of the engine box 3/4" back from the front edge of the box. Use the hardware supplied with the servo to attach the servo to the engine box.



Step 4

Use a 4-40 threaded rod and two clevises to make a throttle pushrod of the appropriate length. Make any necessary bends in the linkage to prevent binding during operation.

Step 5

Attach a 4-40 rod with a ball link to the choke lever. Route the linkage to the bottom of the fuselage where it can be easily accessed during the starting of the engine.

Completing the Engine Installation

Step 1

Run the fuel lines from the pick up in the tank to the carburetor and run the vent line out the bottom of the firewall. We recommend using a fuel filter and a kill switch mounted on the fuselage for convenient fueling and safety.

Step 2

Use a rotary tool with a cut-off wheel and drum sander to cut out a large air outlet at the aft edge of the cowling. Also make any necessary cutouts for items such as mufflers, carburetors, linkages, etc.

Step 3

Mount the cowl using five 4-40 x 3/4" socket head screws and #4 washers. Use a small piece of fuel tubing between the cowl and washer to prevent the screws from vibrating loose during flight. Mount the propeller and spinner to complete the procedure.

Section 14 – Hatch Assembly

Required Parts

- Hatch
- 4-40 x 1/2" screw (4)
- Decals
- Canopy
- #4 washer (4)
- 1/3-scale pilot

Required Tools and Adhesives

- Hex wrench: 3/32"
- Shoo Goo
- Formula 560-canopy glue
- Masking tape

Step 1

The Edge hatch comes pre-installed on the fuselage and is held on with two 4-40 socket head cap screws. Remove these and lift the hatch from the fuselage.

Step 2

Cut out the instrument panel decal from the decal sheet. Attach it to the hatch as shown.

Step 3

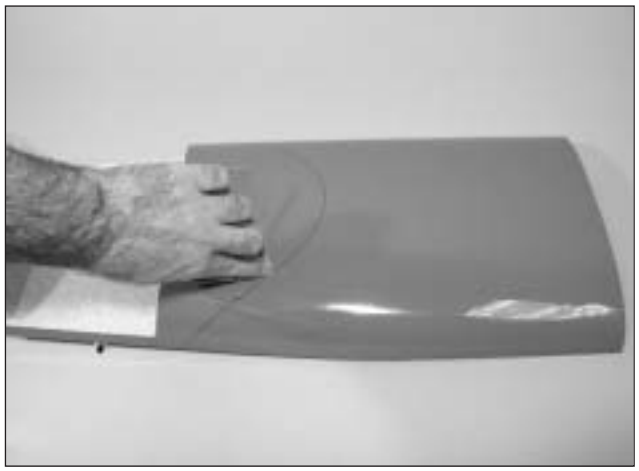
Install a 1/3-scale pilot figure to the hatch using Shoo Goo or similar adhesive that will remain flexible. Let the glue dry before securing the canopy in place.

Step 4

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

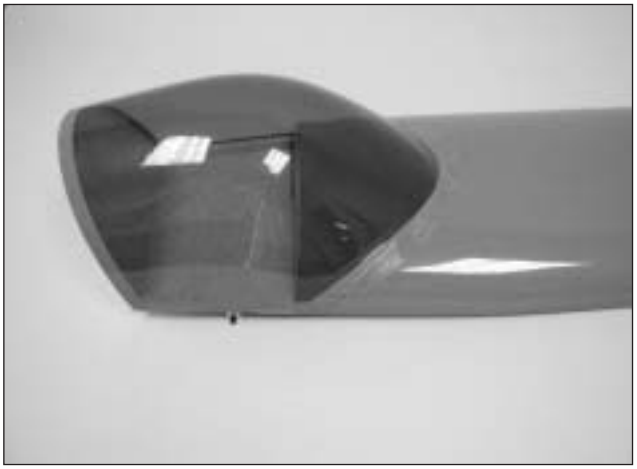
Step 5

Lightly sand the inside edge of the canopy and slightly inside the line drawn on the hatch using medium sandpaper.



Step 6

Apply a bead of RCZ56 Canopy Glue (ZINJ5007) 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 7

Apply the decals using the photos on the box as a guide.

Section 15 – Balancing the Model

Correctly balancing an aerobatic model is critical to its performance and flight characteristics. Checking the balance on giant-scale models is best done with two people.

Step 1

Measure back 6"–6 3/4" from the leading edge at the wing tip and mark the CG range with a felt-tipped pen. This is the recommended center of gravity (CG) range.

Step 2

Fully assemble the model. With a helper, lift the airplane with your index fingers to find the balance point. The balance point (CG) should lie between the two marks on the wing. If not, add the necessary weight to the nose or tail to obtain the correct balance.

Section 16 – Radio Setup

A 7-channel or greater computer radio is highly recommended. This allows the following features:

- Mixing the right aileron to the left aileron (flaperon mix)
- Electronically adjustable aileron differential
- Mixing the right elevator to the left elevator (dual elevator mixing)
- Independent travel and trim adjustments of each elevator half
- Mixing the right rudder servo to the left rudder servo (not required when using a single rudder servo)

When using a 7-channel or greater computer radio, each servo is plugged into its own separate channel. Consult your radio manual for specific details on hookup and programming.

If using a 6-channel radio with flaperon mix, the aileron servos are each plugged into their own channels. The right aileron plugs into the aileron socket in the receiver, while the left aileron plugs into channel 6. With flaperon activated in the programming, this allows for independent travel adjustment of each aileron in each direction and electronic aileron differential. Consult your manual for more programming details.

With a 6-channel computer radio, it will be necessary to Y-harness the two rudder and elevator servos; a reversed elevator servo is needed to achieve the correct control direction. A servo reverser can be used here. Special attention must be taken with the rudder servos so that they don't fight each other throughout the rudder travel. This is caused by nonsymmetrical pushrod geometry from right to left. It may be necessary to rotate the arm on the servo one or two splines (most of the time toward the rear) and readjust the linkage length in order to prevent binding.

Using a non-computer radio will require that the aileron, elevator and rudder be Y-harnessed. Be sure to use a reversed servo (or a reverser) for one of the elevator servos. Special attention must be taken with the rudder servos so that they don't fight each other throughout the rudder travel. This is caused by non-symmetrical pushrod geometry from right to left. It may be necessary to rotate the arm on the servo one or two splines (most of the time toward the rear) and readjust the linkage length in order to prevent binding. If you've ever thought about purchasing a computer radio, now is a good time to do it!

Section 17 – Control Throws

	Standard	3D
Aileron		
	20° up	40° up
	20° down	40° down
Elevator		
	15° up	40° up
	15° down	40° down

	Standard	3D
Rudder		
	26° right	44° right
	26° left	44° left

Preflight at the Field

Range Test Your Radio

Step 1

Before each flying session, be sure to range check your radio. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the receiver in your airplane. With your airplane on the ground and the engine running, you should be able to walk 30 paces (approximately 100 feet) 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.

Step 2

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

Step 3

Be sure that your batteries are fully charged, per the instructions included with your radio.

Setup and Flying by Mike McConville

Our new Edge 540 is without a doubt our best aerobatic aircraft yet. When designing this model, I incorporated design features and enhancements that have been learned from several years of IMAC and 3D flying.

The Edge is fine-tuned and tweaked to excel in both precision aerobatics and wild freestyle type 3D, so doing any aerobatics will be easier than it has ever been.

Preflight

Before getting to the really fun stuff—flying— I'd like to reiterate some very important steps that were covered in the assembly instructions. For those of you who are veterans of large models, this is old news. But to you newcomers to the world of large models, this is **very** important info.

While many smaller models are very tolerant of improper control linkage setups and flying techniques, large models are not. Don't let that scare you away from large models; they are truly one of the best flying experiences in RC that money can buy. However, please pay particular attention to the following areas:

Seal the aileron and elevator hinge gaps.

This should be considered part of finishing the model, and is as important as installing the fuel tank or battery pack. On large aerobatic models, this is absolutely necessary. Failure to do this may very well cause control surface flutter, and on a large model, this will most likely cause a crash. Putting safety and model preservation to the side, there are several other reasons to do this on an aerobatic model. It will increase the effectiveness of the control surfaces, and the model will track more true and precise. Hinge gaps sealed? CHECK!

Maintain the proper mechanical advantage on all control surface linkages.

Same as unsealed hinge gaps, this is often the cause of flutter. Please follow the control horn and servo arm lengths recommended in this manual. Shorter arms on the servo or longer control horns on the elevator and ailerons are fine, but do not try to go the other way to increase throw. It will cause flutter on the Edge. The recommended linkage setups are more than adequate to achieve full 3D throws. That's straight off of the prototypes. Linkages are set? CHECK!

Never attempt to make full throttle dives!

Large models perform much more like full-size aircraft than small models. If the airframe goes too fast, such as in a high throttle dive, it may fail. The Edge should be flown like a full-scale Edge. Throttle management is absolutely necessary. If the nose is down, the throttle comes back. CHECK!

The Prototype Model Setup

All of the recommended settings in this manual are a result of the flight testing on the prototype Edges. There are no secrets. If you follow the instructions and these tips, your Edge will be set up just like mine.

Although a computer radio is not mandatory, it is preferable in this model. I use Exponential on all controls to soften the feel around neutral. This makes it easier to fly smooth in precision maneuvers and also makes it less likely to over-control in 3D mode. I use the following expo values:

Elevator +38% Low Rate, +70% 3D Rate

Aileron +40% Low Rate, +55% 3D Rate

Rudder +25% Low Rate, +50% 3D Rate

Note that + expo values soften the neutral with JR® radios. Other brand systems may require "-" (negative) expo values to soften the neutral.

I use a 6V battery pack for maximum speed and torque from the servos.

The prototype Edges were tested with the Zenoah® GT80. Swinging a Pro Zinger® 24x10 the performance is unlimited and allows anything imaginable from torque rolls just a few inches off the ground to multiple vertical snaps.

> **Performance Tip**: Drill eight 5/16" diameter holes through the internal baffle plate in the GT80 mufflers. I drilled seven through the intake opening and one up through the exhaust stack. Just be sure to flush out all of the metal shavings from the mufflers. This little 10-minute trick will add 300 rpm to the top end.

Computer Radio Enhancements

A computer radio will allow you to do quite a bit of fine-tuning of the feel of the Edge, which will make aerobatics even easier. Below are the programming enhancements I normally use to trim out an aerobatic model.

Rudder-to-Elevator and Rudder-to-Aileron Mixing

This mix is used to dial out unwanted pitch and roll caused by the rudder. The Edge has very little coupling, and depending on your CG, may not require any mixing. If needed, dialing it out will make knife-edge maneuvers easier. Use a preprogrammed mix if your radio has this feature, or if not, use a P-mix feature. Assign rudder as the master channel and elevator as the slave. Set the mixing values so when the rudder is deflected all the way in either direction on high rate, the elevator moves 1/4", and fine-tune from there.

For mixing out roll coupling, make the rudder the master channel the ailerons the slave channel. Fine-tune the mixing as necessary to eliminate any roll coupling that may be present in flight.

Spoileron Mixing

This can be achieved by using either a preprogrammed elevator-to-flap mix or a P-mix. Assign elevator as the master channel and flap as the slave. Set the mix values so that when full up, 3D elevator is given, both ailerons also go up 7/16" (16°). This mix helps stabilize the model in some 3D maneuvers such as the Elevator and Harrier.

Throttle Curve

This is normally a preprogrammed function. It can also be achieved in radios that do not have this premix but do have curve type P-mixing by mixing throttle as the master and slave channels. Then adjust the curve to get the desired throttle servo response. This is particularly useful to get an engine to "act" linear throughout the entire throttle stick movement. I also use this at times to make the throttle response less sensitive in the rpm ranges used for hovering the model. This makes altitude control easier and smoother when doing torque rolls.

Rates and Expos: when and where to use them

I always use Expo to soften the feel of the model. On high 3D rates I use quite a bit. The goal on 3D rates is to get the model to feel the same around neutral as it does on low rates.

I use low rate settings for all flying except for 3D aerobatics. For precision flying or general sport hot-dogging, the low rate throws are perfect, even for snap rolls. The only exception is rudder rates. I go to 3D rate when doing stall turns and rolling circles, since the more rudder the better for these. When doing 3D aerobatics, I normally flip to 3D rates just before the maneuver. As soon as the maneuver is done, I flip back down to low rate to avoid over-controlling the model.

Let's Get Down To It

When flying aerobatics with a larger model, you will find that it will do everything just like a smaller model… only better and easier. There are just a few exceptions to how things are done.

Throttle management is a must. You have to throttle back to idle when the nose is pointed down.

Snap Rolls

Just like the need to be throttle-managed like a full-scale airplane, larger aerobatic airplanes need to be snapped like a full-scale. Don't feel bad if this seems like a big "What are you talking about?" to you. It took me quite a while to figure this out. Let's back up to how we all learned to do a snap roll. If it's an inside (positive) snap, we pull the sticks into the corner, i.e. full up, full aileron, and full rudder in the same direction as aileron. When we want to stop snapping, we release the controls. For smaller models, this technique not only works, but is normally the only way to get the model to snap. In a full-scale aerobatic plane, as well as with large models, snaps are different, particularly on the new breed of aerobatic birds like the Edge 540, which have large control surfaces.

Unloading Snaps

That's the whole trick. To start a snap roll, the same method as with a smaller model is used. Pull full up, full rudder and aileron in the same direction. But as soon as the sticks reach the corners, neutralize the elevator, while keeping the rudder and ailerons at full deflection. When you do this correctly, the Edge will not get "deep" into snaps. This allows it to keep more airspeed as it exits the snap, so it stops snapping where you what it to and flies out with more air speed. You'll also find that it will be a lot easier to exit a snap heading the same direction you were going when you entered the snap. It'll take a little practice to get the hang of "flying" the snaps, but I'll bet you'll see a big improvement in the quality of your flying.

3D maneuvers (in simplest terms) are maneuvers performed by an airplane that are not usually done in a normal airplane flight path. What can be done with a 3D-capable plane is to make it fly like no other. For example, hovering in the air nose high at a 45-degree descent, floating along in level flight, hanging on the prop, or tumble tail-over-nose in a rapid flipping motion. When you sprinkle these maneuvers together with other loops, rolls, snaps and spins, it seems like the aerobatic options are endless.

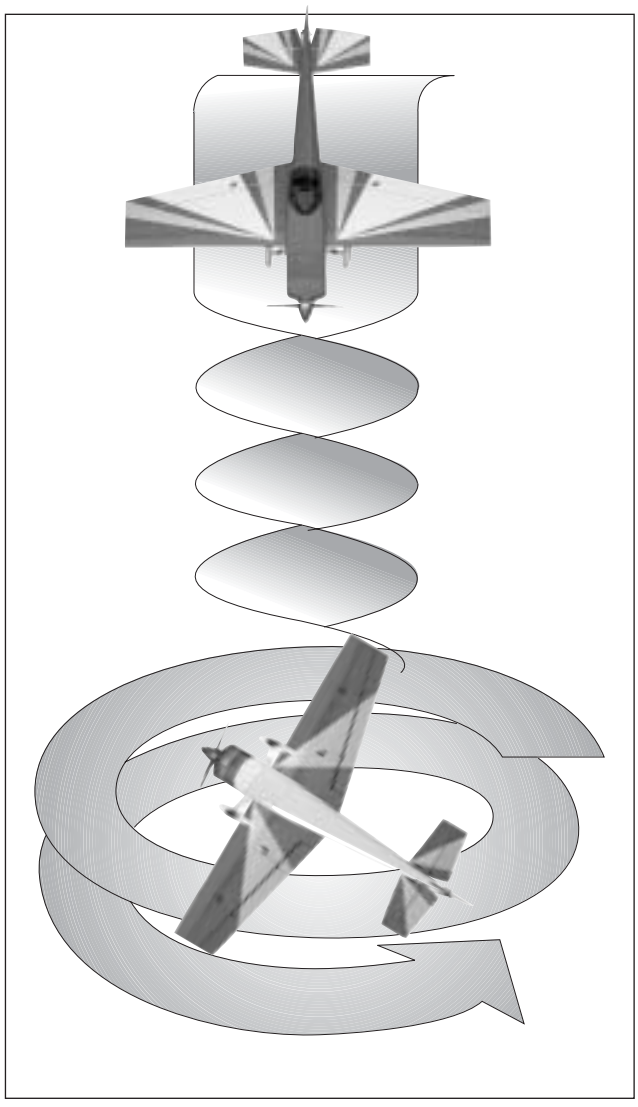
To fly 3D, you must have a plane that's capable. What's capable? Well, it starts with having outlandish pitch control from having huge elevators. The same applies, but not to the same extent, with rudder and ailerons. When it comes to 3D aerobatics, our Edge 540 is second to none, and has already proven itself in "combat" having placed first and second in its first freestyle competition.

The Maneuvers

Let's cover the seven 3D maneuvers where the Edge 540 really excels.

The Blender

What it is: The Blender or Panic maneuver is a vertical diving roll that virtually stops its descent as it instantaneously enters into a flat spin.



Setup: Follow the 3D setup as described in the manual. Be sure to use Expo. Setting the CG toward the aft location will help, but I have had great results even at the forward CG location. This is a wing tester and can be extremely violent but will always generate gasps of excitement. But done correctly, the Edge 540 can handle the challenge.

How to do it: Start from about 400–500 feet straight and level, chop throttle, and push the nose straight down. As soon as the model is diving straight down at low throttle, add full left aileron. Let the model compete two or three rolls and then quickly transition the sticks to an inverted snap roll position (left aileron, right rudder, down elevator) all at the same time. As soon as the Edge enters a spin, quickly neutralize the ailerons while holding full right rudder and down elevator. If you do it right, the airplane will instantly transition from a left roll to a flat spin in the same direction, and the decent will all but stop.

Tip: Add full throttle just after the spin goes flat. That'll keep fuel going to the engine, make the rotation speed high, and help stop the vertical descent.

Recovery: Simply release rudder and hold just a little down elevator. The model will stop rotating and begin to fly out. As it gains airspeed, roll back to upright. Since you're in 3D mode, make sure you don't do anything abrupt, or you'll stall again.

The Elevator

What it is: The plane drops vertically while in a nose high attitude. Depending on the head wind conditions, the model will drop anywhere from about a 45-degree angle in calm conditions to vertical or even a little backwards in more windy conditions. Throttle is used to determine rate of descent and the nose high attitude of the model.

Setup: Same as the Blender, only for this one, flip the switch to turn on the spoilerons. This will help to keep the Edge 540 from teetering back and forth.

How it's done: At near stall airspeed up high, slowly feed in up elevator until you have the full 3D rate up in it. With low throttle, the Edge will fall like a rock. To guide it around, use the rudder, not ailerons. Just keep the wings level. Add power to change the attitude of your Edge 540.

Trickiest part: Aside from steering it with the rudder, you'll quickly see that this maneuver is a matter of juggling the throttle and rudder to get the plane to go where you want it to go.

Recovery: Basic recovering—add full power, flip to normal rate elevator, and fly out.

Advanced Recovery: Take the elevator all the way to the ground—adding some power before it touches down to slow the descent and transition into a Harrier and land.

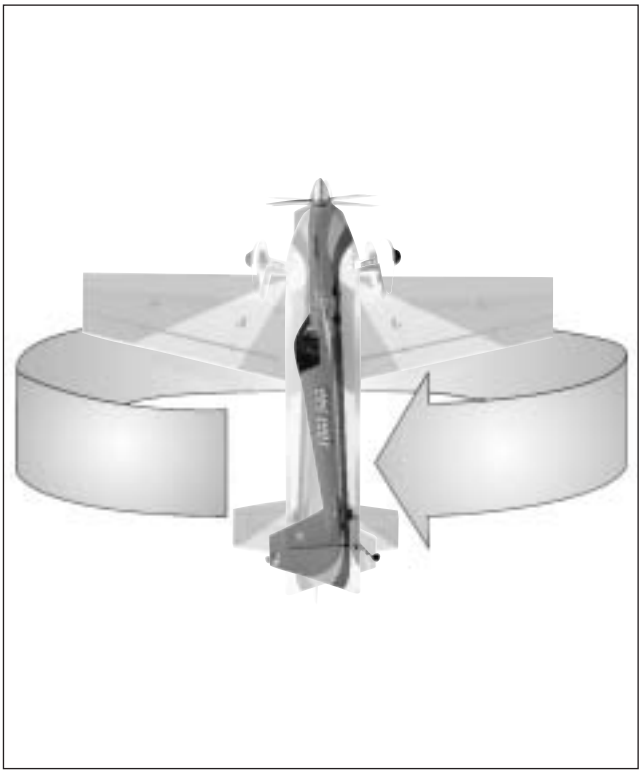
OR

Add power to get the nose to rise to vertical and transition into a torque roll. Elevator down from a hundred feet down to 20 feet (or less) and power up into a torque roll. Ooh!!

Worst way to mess up: Let your direction control (rudder) get away from you after starting too low—you could snap it right into the ground. Ouch!

The Torque Roll

What it is: The Edge 540 "hovers" vertically in place, rotating left around its roll axis.



Setup: Full 3D throws in elevator and rudder are a must. An aft CG helps a little. Also gyros provide the best aid to stabilize the aircraft. They won't do the maneuver for you but they'll help. I found them a fantastic tool in learning to torque roll, kind of like training wheels. A few years ago gyros made a big difference for me; now I don't use them anymore. You'll need to use the Zenoah® GT80 or an engine that will give you unlimited vertical before you try this one.

How it's done: Fly low along the ground at low throttle and gently add power with up elevator to bring the model into a vertical position. Add throttle to keep the nose pointed up and make corrections with rudder and elevator to keep things straight. If the model hovers but won't start rolling left, quickly blip the throttle up and down. The torque change will usually get it going.

Trickiest part: Recognizing your correction when the model's belly is toward you.

Tip: Think: push the rudder toward the low wing when the belly is toward you. You have to be fast with throttle corrections. Add bursts of power, along with rudder/elevator corrections. If you simply hold full throttle, you'll climb out of the maneuver.

Recovery: Fly out at full throttle.

Worst way to mess up: Have an unreliable engine. Torque Rolls are tough on engines because there's only prop-induced airflow over the cylinders. I'd really recommend putting the baffling in the cowl if you are running a twin-cylinder engine and plan on doing Torque Rolls.

The Parachute

What it is: The Parachute is a vertical dive that instantly decelerates in its descent as it instantaneously corners into an Elevator.

Setup: Same as the Elevator, and the raised ailerons help in this maneuver too.

How to do it: Start from about 400-500 feet straight and level, chop throttle, and push the nose straight down. As soon as the model is diving straight down at low throttle, add full up-elevator. If you do it right, the Edge 540 will instantly transition from a vertical dive to an Elevator.

Tip: Add a little throttle just after transition to an Elevator. That'll keep fuel going to the engine and keep it from quitting.

Recovery: Simply add full power and reduce elevator to transition into normal forward flight.

Advanced Recovery: Juggle the throttle to slowly lose altitude and do a Harrier landing. The model will land on the rear of the rudder first, and then add a little power so it doesn't smack the landing gear too hard.

Worst way to mess up: To build up too much speed. This maneuver has a huge "WOW" factor but, just like a Blender, too much speed and it over-stresses the wing. Watch the speed.

The Wall

What it is: The Wall is a Parachute turned on end. The model starts in normal level flight and suddenly corners nose up 90 degrees, as if it hit a wall.

Setup: Same as the Elevator, and the raised ailerons help in this maneuver too.

How to do it: Start from about 100 feet straight and level, chop throttle, and as the model begins to slow down, quickly pull full up-elevator. When the Edge 540 corners to vertical, add full power and release the up-elevator.

Tip: Start a low speed and add power at the same time that you begin to pull full up-elevator.

Recovery: Simply release the elevator, go to full throttle, and fly out upward.

Advanced Recovery: Juggle the throttle to sustain a hover and transition into a torque roll.

Worst way to mess up: Don't get the throttle in quickly enough and the model falls backward.

Great combo: This has become one of my favorites to do with the Edge 540. Takeoff normally, but as soon as the Edge is airborne, chop the throttle and do the Wall, then transition into a Torque Roll over the runway. Practice all of this stuff up high before you try that.

The Harrier

What is it: It is very slow forward flight in a very nose high (about 45 degrees) attitude.

Setup: Same as the Elevator, and the raised ailerons help in this maneuver even more.

How it's done: Start by entering an Elevator maneuver. Let the Edge drop a small amount, then slowly add power until the vertical descent stops and the model begins to fly forward with the nose very high, all the while your holding full up-elevator (on 3D rate). Juggle the power to control the attitude and forward speed of the model. In a head wind, you may also have to juggle the elevator some to keep the model from pitching up to a vertical attitude. Use the rudder to steer the model around in the Harrier attitude. Try to use the ailerons very little, as they will cause the model to wobble side to side.

Trickiest Part: Keeping up with the model if it begins to wobble.

Recovery: Simply add full power and reduce elevator to transition into normal forward flight.

Advanced Recovery: After you get the hang of flying around in the Harrier, juggle the throttle to slowly lose altitude and do a Harrier landing. The model will land on the rear of the rudder first, and then add a little power so it doesn't smack the landing gear too hard.

I hope you enjoy your Edge 540 as much as I do!

Happy Landings!

Mike McConville

2004 Official AMA National Model Aircraft Safety Code

Effective January 1, 2003
Model Flying MUST be in accordance with this Code in order for AMA Liability Protection to apply.

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), 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 under 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.

2004 Official AMA National Model Aircraft Safety Code

Continued

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.)

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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