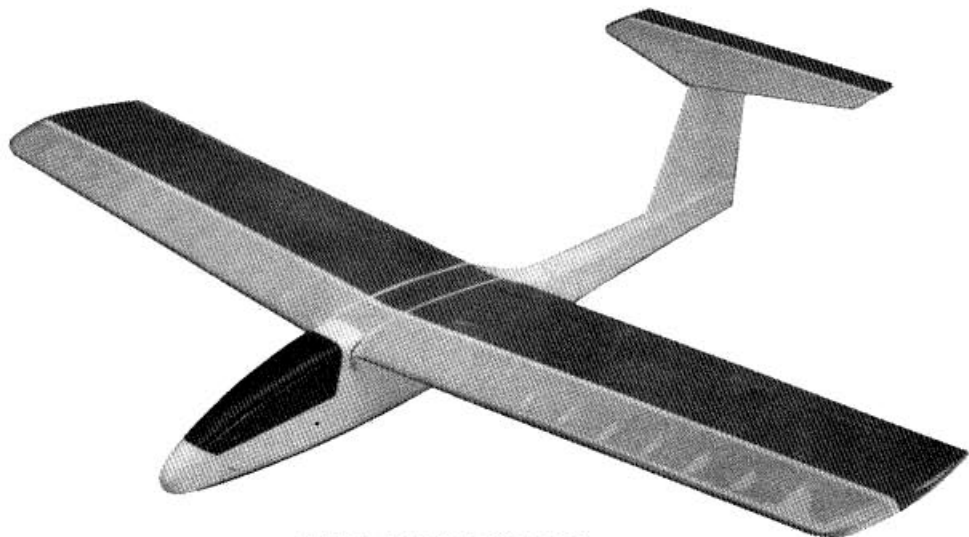


RIDGE RUNT

A SLOPE AILERON TRAINER THAT FLIES AS GOOD AS IT LOOKS!



INSTRUCTIONS

The Hobby Shack Ridge Runt was designed to be an aileron slope trainer for the pilot wishing to transition from rudder/elevator floaters. However, the experienced pilot will find it to be agile enough for basic aerobatics, and great fun for sport flying. Due to its simple construction and light weight, the Ridge Runt will fly on the slope in light to moderate winds. Its clean design will also allow it to fly in high wind conditions with the addition of a small amount of ballast.

The Ridge Runt can be flown several different ways: it can be flown from the slope, hand launched, high started, or even with a power pod. When flown from the slope, simply toss the model into the wind and fly back and forth across the face of the hill. Initially all turns should be made away from the hill till you feel comfortable with your model. Although the Ridge runt was designed primarily for slope soaring, it has successfully been flown from a high start. The tow hook should be placed about 1/2" ahead of the CG (center of gravity) for initial flights. Control inputs should be kept to a minimum during tow, as the model goes up the line very rapidly. Even though the model is quite small its light weight makes it capable of reasonable thermal flying. One advantage to its small size is that you can work small, fast moving thermals, even dust devils! The model can be set up with a power pod in either a tractor or pusher configuration. For easy sport flying use a Cox Black Widow; for higher speed, aerobatic flight, use a Cox Tee Dee .049 or .051.

ADDITIONAL ITEMS NEEDED TO COMPLETE YOUR KIT

- 1 to 2 rolls of Flite Kote or similar covering. Model can be covered with one roll, but two rolls will be needed for a two-tone finish.
- Lightning 5 Minute Epoxy and CA glues
- Sullivan .056 cable pushrod
- Goldberg 1/16" aileron pushrod wire
- DU-BRO EZ connectors
- Goldberg nylon clevises
- Sig Easy-Hinges
- Foam rubber for radio protection
- #62 or 64 rubber bands
- Two or more channel radio

MODELING TOOLS NEEDED FOR CONSTRUCTION

- Razor saw
- Xacto knife with No.11 blade
- Drill
- Sanding block and sandpaper
- Soldering iron and solder

OPTIONAL ITEMS

- Tow hook
- Power pod
- Engine and prop

BUILDING INSTRUCTIONS

GETTING STARTED

The first step is to totally familiarize yourself with the plans and instructions before starting actual construction. Be sure you understand each step and what parts are needed before gluing. Cover your plans with wax paper or similar material to protect them during construction and to prevent parts from being glued to them. All parts should be held firmly in place during construction with pins. To pin parts down it will be necessary to get yourself a piece of Celotex board, or firm cork sheet from your local hardware store. Place this on your workbench which should be straight and free of warps. Your finished model will only be as straight and true, as the surface it is built on.

Use Lightning 5 Minute Epoxy and CA glues for construction. Most of the model will be built with Lightning Thin and Slow CAs. High stress areas will be glued with 5 minute epoxy. When gluing be sure to use only the amount of glue necessary for a good bond. Excessive amounts of glue will not make the model stronger, only heavier and harder to finish sand. Always use caution and follow all manufacturer's recommendations and safety warnings when using epoxy or CA. Work in a well ventilated area with good lighting.

CONSTRUCTION

FOLLOW THE BUILDING SEQUENCE AS LISTED:

- A. Horizontal and Vertical Tail Surfaces
- B. Wing
- C. Fuselage
- D. Covering
- E. Final Assembly
- F. Radio Installation
- G. Flying

Check off each step in the provided box as you go along. Make sure each box is checked off before going on to the next step.

A. HORIZONTAL & VERTICAL TAIL SURFACES

1. Locate die cut horizontal tail pieces S-1 (1) and S-2 (2), remove from die sheets and make sure all edges are sanded clean. Also locate 1/8x1-5/16x12" stab center section and 1/8x1x14" elevator.

Pin the center section directly over the plan view of the horizontal surface.

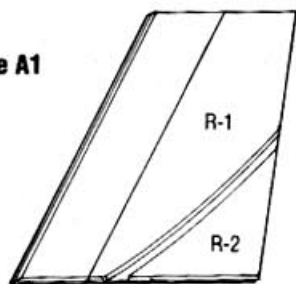
Glue S-1 with Thin CA to the front of the center section sheet.

Glue the S-2 stab tips with Thin CA to each end of the center section and S-1.

Sand all glue joints flush with a sanding block and sand the leading edge and tips round. Sand the leading edge of the elevator to a rounded contour or double bevel for hinge movement.

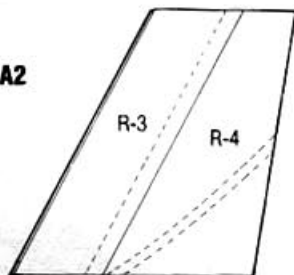
2. Locate die cut vertical tail pieces R-1 (1) and R-2 (1), remove from die sheets and make sure all edges are sanded clean. Also locate 1/8x1-1/16" front fin from sheet stock. These parts make up the core of the vertical tail surface, see figure A1.

Figure A1



- Locate die cut vertical tail pieces R-3 (2) and R-4 (2), remove from die sheets and make sure all edges are sanded clean. Also locate the 1/4x6" balsa tail post. These parts make up the outer skins of the vertical tail surface, see figure A2.

Figure A2



- Glue the R-3 and R-4 skins together with Thin CA, see figure A2.

Be sure to keep the top and bottom surface in line with one another.

Lay one finished skin directly over the vertical surface plan view. Now glue the R-1, R-2, and fin front pieces to the finished skin with Slow CA, see figure A3.

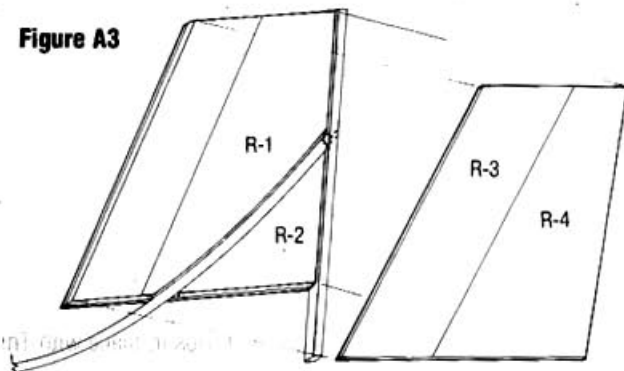
Glue the 1/4x6" balsa tail post to the back of the vertical surface with Slow CA, see figure A3.

Drill an 1/16" inch hole in the tail post at an angle to coincide with the slot for the pushrod.

Now glue the outer push rod housing in the slot with Slow CA.

Glue the remaining skin with Slow CA to close the structure and capture the pushrod housing, see figure A3.

Figure A3



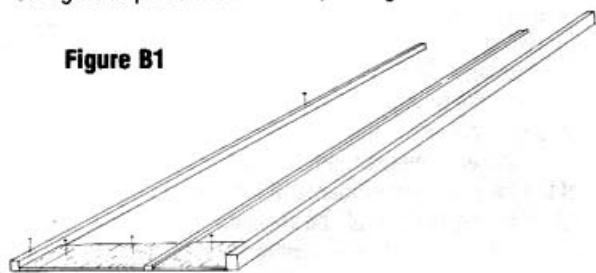
Sand the tail post flush with the top edge of the finished vertical surface.

Sand the leading edge round and finish sand the entire piece. Set the entire assembly aside until covering and final assembly.

B. WING

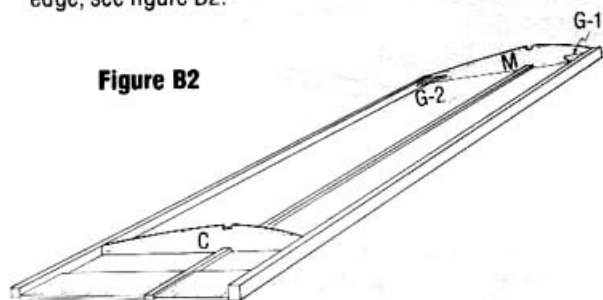
- Locate the 1/8x1/4x24" hardwood spars (4), 1/4x1/4x24" balsa leading and trailing edges (2 ea.), and 1/16" balsa sheet for the center section planking.
 Position the spar directly over the location on the plan and secure by crossing pins over the spar. DO NOT attempt to put pins directly through the spar.
 Position the leading and trailing edge over the location on the plan and pin in place.
 Cut the center section planking to match the plans and glue in place with Thin CA, see figure B1.

Figure B1



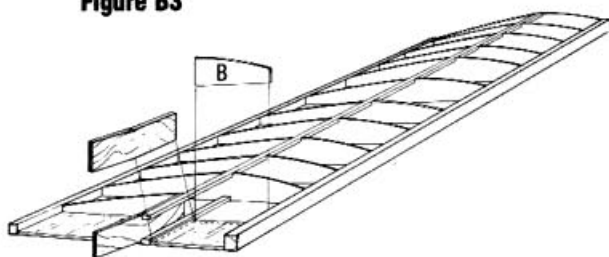
- Locate die cut wing ribs A through M (2 ea.), remove from die sheets and make sure all edges are sanded clean.
 Glue ribs C and M in place with Thin CA at the leading edge, spar, and trailing edge.
 Locate and remove tip gussets G-1 (2) and G-2 (2) from die sheets and make sure all edges are sanded clean.
 Glue 1 each, tip gussets G-1 and G-2 against rib M at the leading and trailing edge with Thin CA. Glue the gusset in place at the middle of the leading and trailing edge, see figure B2.

Figure B2



- Glue ribs D through L in place with Thin CA at the leading edge, spar, and trailing edge.
 Glue the top 1/8x1/4x24" hardwood spar in place with Thin CA. Be sure to carefully line it up with the bottom spar.
 Locate die cut 1/8" dihedral braces (2), remove from die sheet and make sure all edges are sanded clean.
 Glue the two dihedral braces to the top and bottom spars with 5 minute epoxy. Clamp until dry, see figure B3.
 Glue the front and rear A and B ribs in place with Thin CA, see figure B3.

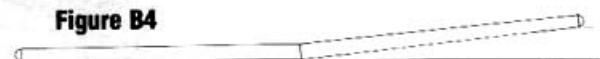
Figure B3



- Locate 1/16x1-7/8" balsa planking for shear webs and cut shear web material (make sure grain runs vertically) to fit against the sides of the top and bottom spars between ribs B and J, on the rear side of the spar structure.
 Glue shear webs between ribs B and J to the top and bottom spars using Slow CA. Be sure to get a good glue joint between the spar and the shear web.
 Cut shear web material to fit against the sides of the top and bottom spars, between ribs B and E, on the front side of the spar structure.
 Glue shear webs between ribs B and E to the top and bottom spars using Slow CA. Be sure to get a good glue joint between the spars and shear web.

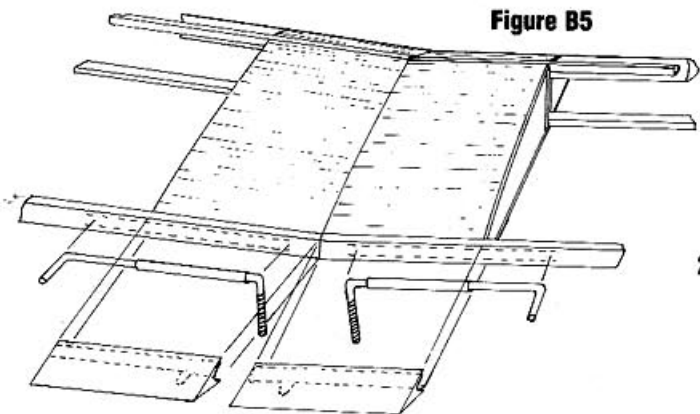
- Repeat the above steps for the other wing panel (except for the gluing of the dihedral braces and rib A). Check off the second set of boxes as you finish each step.
 Prop up the wing tip of the second panel 1-1/8" and sand the root section (area where rib A will be located) of the leading edge, center planking, spar structure, and trailing edge perpendicular to the work surface. This will give you the proper dihedral angle, see figure B4.

Figure B4



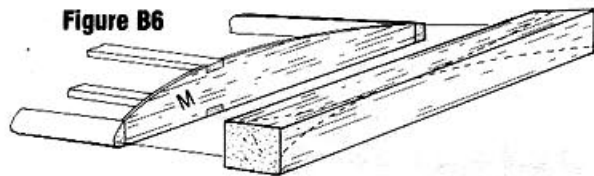
- Glue the two panels together with 5 minute epoxy. Clamp the dihedral braces to the spar structure of the second panel until dry.
 Glue the remaining rib A, front and rear pieces to the center at rib A of the first panel with Thin CA.
 Cut and fit the top 1/16" balsa planking for the wing center section. Glue in place with Thin CA.

- Locate the balsa tapered aileron material (2).
 Cut the ailerons to length using the plan as a guide. Save the short left over section for the wing center section.
 Using the short left over aileron section, cut them to length to match the center section of the wing.
 Position the aileron horns and cut a groove for the horns in both pieces, see figure B5.

Figure B5

- Glue the center trailing edge sections with Slow CA trapping the aileron torque rod bearings in the groove. Be very careful not to get any glue in the torque rod bearings.
- Double bevel the front edge of the ailerons for hinge clearance and drill a hole in the center of the hinge line to accept the aileron torque rod. Cut a groove to clear the torque rod between this hole and the root of the aileron.
- Cut hinge slots and fit the ailerons to the wing with the torque rod and hinges. DO NOT glue at this point.

6. With the aileron in the neutral, glue the wing tip blocks (2) to rib M with Slow CA, see figure B6. Mark the profile of rib M and the aileron on the tip block. Sand the tip block to the airfoil profile and round off.

Figure B6

- Finish sand the entire wing and round leading edge.

C. FUSELAGE

1. Before starting, make sure to construct one left, and one right fuselage side.
- Locate die cut fuselage sides (2) and doublers D-1 (2), remove from die sheets and make sure all edges are sanded clean.
 - Place one fuselage side directly over the plan and place the second against it, bottom to bottom. Make both sides as you go along.
 - Glue doubler D-1 in place with Slow CA making sure that you line up the holes in D-1 with the holes in the fuselage sides, see figure C1.
 - Locate the 1/8x1/4x9" hardwood stringer and the 3/8x24" triangle stringers.
 - Glue the 1/8x1/4x9" hardwood stringer in place along the canopy opening with Slow CA, see figure C1.
 - Glue the bottom 3/8" triangle stock with Thin CA to the full length of the fuselage except for the last 1/4", see figure C1.

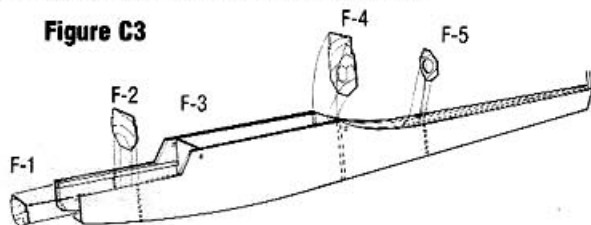
- Prepare the top piece of 3/8" triangle by either soaking one end in water or slitting it with a razor saw to make the bend possible. Glue it in place with Thin CA, see figure C1.

Figure C1

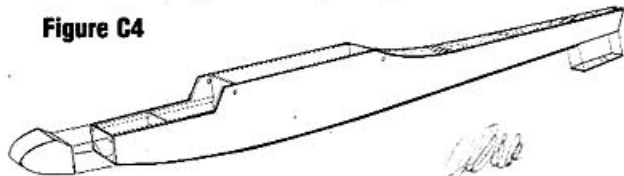
2. When both sides have all stringers glued in place you can join the two sides.
- Locate die cut formers F1 through F5 (1 ea.), remove from die sheet and make sure all edges are sanded clean.
 - Using the plan, mark the position of all formers on the two fuselage sides.
 - Sand the triangle stringers at the rear of the fuselage at an angle that will allow the sides to come together with a 1/4" spacer between them. Put a 1/4" spacer at the rear of the fuselage and rubberband together (do not glue).
 - With the bottom of the fuselage flat on the building board glue former F-3 in position with 5 minute epoxy or Slow CA being sure to keep the fuselage sides square, see figure C2.

Figure C2

- In succession, glue in F-4, F-2, F-5, and F-1 with 5 minute epoxy or Slow CA being sure to keep the fuselage sides square as you go along, see figure C3.

Figure C3

3. Locate the 1/16" balsa fuselage top and bottom planking.
- Cut and glue the planking cross grain to the top and bottom of the fuselage with Thin CA. Cut a 1/4" slot at rear of top planking for the vertical surface tail post, see figure C4.
 - Locate the balsa nose block and glue to former F-1 with 5 minute epoxy or Slow CA, see figure C4.

Figure C4

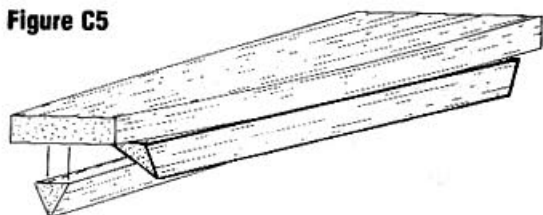
4. Locate die cut canopy sides (2), remove from die sheet and make sure all edges are sanded clean. Also locate the shaped canopy top block, 1/8" balsa end bulkheads, and 1/2" triangle stock. These parts make up the structure of the canopy.

- Lay the two 1/2" pieces of triangle stock over the full size drawing and angle the ends to match.



- Glue the two pieces of 1/2" triangle stock to the bottom of the canopy top block with Thin CA leaving room for the two end bulkheads at each end. Make them flush only at the center and sand the overhang off each side, see figure C5.

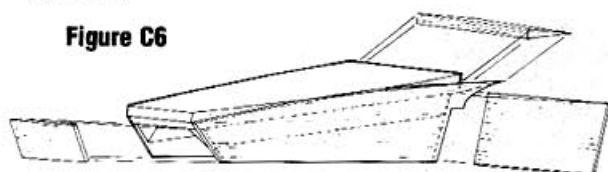
Figure C5



- Using the fuselage sides as a guide, glue the two canopy sides with Thin CA to the canopy top block and the two end bulkheads to the sides and top, see figure C6. This can be accomplished without gluing the canopy to the fuselage by first lining the canopy opening with wax paper.

- Finally, glue the tapered stock between the canopy sides at the rear of the canopy top block with Thin CA, see figure C6.

Figure C6



- Drill hole in front canopy bulkhead and inside of nose block for 1/8" locating dowel and glue to canopy with Slow CA.

- Tack glue the canopy to the fuselage and finish sand the entire structure. Due to the use of the triangle stock stringers, you can sand your Ridge Runt's fuselage to a nice rounded section without sacrificing strength.

Basic construction is finished at this time.

D. COVERING

Before covering, go back over the entire structure and check for gaps, irregularities, or lumps of glue. Fill and sand all surfaces again before proceeding with covering. A well sanded model will produce the best final finish. Use a tack rag to remove all sanding dust before applying covering. Covering applied to a dusty model will not adhere well. When applying covering follow the manufacturers directions and suggestions for the best possible finish.

1. □ Start by covering the horizontal tail surface and elevator. Cover the bottom first, then the top.
 - Locate two pieces of scrap 3/8" triangle stock and sand the front and rear to a curve (see plan side view of

vertical and horizontal tail junction) for reinforcement between the two surfaces. Cover the outer surface of the triangle stock only.

- Cover both sides of the vertical tail surface. Do not cover the lower portion of the tail post which fits between the fuselage sides, or the top and bottom of the vertical.

2. □ Cover the wing one section at a time. Do the bottom of one panel, then the bottom of the other. Cover the top of one panel, then the top of the other.

- Cover each aileron doing the bottom first, then the top. Cut the covering away for the hole where the torque rod will be inserted.

3. □ Cover the fuselage by doing the bottom first, then the sides, then the top. Cut the covering away for the holes where the wing dowels protrude through the fuselage sides.

- Cover the canopy by doing the sides first, then the top.
- After you are finished go back and check that the wing is straight. Lay each panel on a flat surface and check that it lays flat. If it does not, twist the wing slightly past the point that will produce a straight surface and reshrink the material. Repeat until the wing is straight. Model does not require washout.

E. FINAL ASSEMBLY

1. □ Lay the two pieces of shaped and covered 3/8" triangle stock against the upper edge of the vertical tail surface. Mark their location on the vertical and remove just enough covering to glue them to each side with Slow CA.

- Locate the position where the pushrod (protruding from the bottom of the vertical fin) will pass through the planking of the top rear of the fuselage.

- Drill a 1/8" hole at an angle for the pushrod housing. Pass the pushrod housing through the hole and center vertical on rear of fuselage. Mark the location of the vertical on the rear of the fuselage and remove the covering for gluing.

- Glue the vertical to the rear of the fuselage using 5 minute epoxy. Make sure to glue the tail post as well as the bottom of the vertical fin. Be sure to keep the vertical square to the fuselage while the glue cures.

2. □ Locate the 1/16" plywood elevator horn (1), and, drill hole for clevis attachment as per plan.

- Locate position of horn on elevator center and remove covering for glue, glue horn securely to elevator with 5 minute epoxy.

- Using Xacto knife cut hinge slots for elevator as per plan location. Cut corresponding slots in horizontal fin. Glue the hinges in with Thin CA.

- Position the horizontal stab on top of the vertical fin. Center front to back and mark location of fin top and triangle stock on bottom of horizontal stab. Remove covering for gluing.

- Glue the horizontal stab in place with 5 minute epoxy.

Be sure to keep it square by measuring the distance from each tip of the horizontal to the nose, these should be equal. Visually check to make sure it sits level with wing saddle area.

Attach ailerons to the wing by gluing the hinges in place with Thin CA. Glue the aileron torque rod at the same time using 5 minute epoxy. It is a good idea to roughen the torque rod for better glue adhesion with a piece of rough sandpaper or a file.

Glue the wing hold down dowels in the holes in the fuselage with Slow CA.

A canopy hold down can be made by gluing a wire hook in the center of the canopy (underside) and a corresponding one in the center of the fuselage bottom. Stretch a small rubberband between the two hooks to secure the canopy.

F. RADIO INSTALLATION

1. Any two or more channel radio will work in your Ridge Runt. There is no need for small batteries, receiver, or servos; although one mini or micro servo for the ailerons will make installation easier, and is recommended.

Take the aileron servo and mark out its bottom outline on the underside of the wing sheeting in the center area just in front of the spar. Cut the sheeting away and the center ribs up to the top sheeting. Use scrap hardwood and build-up a rail at each end of the opening to mount the servo with the screws provided in your radio.

Using two Goldberg EZ connectors (one on each side of the servo arm) hook up the aileron pushrod wires with clevises to the aileron torque rod horns. Adjust the arms up or down until you have about 1/4" to 3/8" of travel each way for initial flights.

The elevator servo is mounted on hardwood rails in the opening under the wing (refer to plan). Cut the pushrod housing to length and glue to the fuselage side and at the point where it's curve touches the fuselage in the rear section and at former F-4. This can be done by applying epoxy to a short stick and inserting through formers F-4 and F-5.

Cut cable to length, insert in the pushrod housing and solder the threaded brass couplers to each end. Lightly tin the exposed cable that exits the vertical fin to prevent bowing. Screw on the clevises and attach to the servo arm and the elevator horn. Move the clevis at the servo arm in or out until you have about 1/4" of travel each way.

3. Wrap the receiver and battery in protective foam. Mount the battery in the first compartment of the fuselage directly behind the nose block. Mount the receiver in the next compartment.

Mount the airborne on/off switch through the fuselage side. Mount it in an area where it can not be inadvertently turned off during launch.

G. FLYING

1. Before taking your Ridge Runt out for its initial trim

flights check the CG (center of gravity) and all control throw directions.

Add lead as necessary until your model balances at the center of the spar when placed on your finger tips. DO NOT attempt to fly your model until it is properly balanced. Do not worry about adding lead to achieve a proper balance. A slightly heavier, balanced model, will perform better than a lighter, out of balance one!

With your transmitter and receiver turned on, check that your elevator (at the trailing edge) moves up when you pull the transmitter stick back. Check that it moves down when you push the stick forward.

Check that your left aileron (when viewing the model from behind) moves up and the right one down when you push the transmitter stick to the left, and vice versa.

2. Before flying make sure that your radio equipment is operating properly and that both your transmitter and airborne are charged. Follow your radio manufacturer's instructions on proper and safe radio operation. Always be sure that no one else is on your frequency before turning your radio on!

With your radio on, face into the wind and launch your Ridge Runt straight ahead. Do not throw the model hard, simply launch it with a steady, straight through motion. Correct its flight path with gentle stick movements to fly in a straight line.

Adjust the trim or shift weight around as necessary to achieve a straight glide with a slightly nose down attitude.

If you are a beginner or feel uneasy about trimming your new model, seek the help of an experienced R/C pilot for the first few flights.

Always fly your model in a safe and courteous manner. Never fly in an area with obstructions, power lines, or too close to houses. We hope you will enjoy your new Ridge Runt and wish you many hours of great flying fun!

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