

# JAEGER

By Mike Hollison

## A Simple Quick Building Aileron/Elevator Design For Slope Or Thermal Soaring

**J**aeger is a slope/thermal design for those who want a snappy looking, easy-to-build fun flier. It is also suitable for the modeler looking for his/her first aileron ship — the construction is lo-tech with a lot of balsa and ply; it uses two channels only (elevator and ailerons) and is a very docile performer, despite its racy lines. So, hang up your current polyhedral, rudder-elevator floater for the season and try your hand at this lean, but not so mean, flying machine!

### CONSTRUCTION

1. Start with the wings by cutting the leading edge and lower wing spars to length and laying them on the plan.

2. Cut out all wing ribs, and epoxy ribs W-3 to W-6 in position.

3. Taper and sand the aileron spar, notch for ribs W-7 to W-10. Lay in place over the plan, glue W-10 in position and epoxy the spar between ribs W-6 and W-10. Add ribs W-7 to W-9.

4. Cut the top wing spar to length and glue in place. Add the 1/4" balsa filler between ribs W-3 and W-4, then cement the 1/16" balsa vertical grain shear webbing between each rib, as indicated on the plan.

5. Repeat steps 1 through 4 for the second wing panel.

6. Next, cut wing joiner J-1 from 1/4" ply and epoxy to the center section of one wing panel between the top and bottom spars.

7. Cut two J-2 wing joiners from 1/16" ply and epoxy the front joiner between W-3 and the center section. Add a piece of 1/4" balsa filler between rib W-3 and J-1.

8. Now, join the two wing panels together and epoxy the rear joiner (J-2) in position, making sure that there are 2" of dihedral at each wingtip under ribs W-10. Add ribs W-1 and W-2.

9. Cut the bottom wing sheeting from 1/16" light balsa and cement to the bottom of each wing panel, remembering to shim up the trailing edge of W-10 by 1/4" to provide wash-out at the tips. Add the rear 1/16" balsa strip spacers between each rib immediately behind the aileron torque rod position, and the scrap-tapered balsa on either side of ribs W-1 for the wing mounting bolt.

10. Slot the top of the aileron spar as indicated for the Kraft "live" hinges and epoxy in place.

11. Next, cut the 22-1/4" long aileron torque rods from 3/32" dia. piano wire and



slide three 1/4" long pieces of 3/32" i.d. brass tubing over each rod, then bend the rods as shown on the plan. Slip into the notches of ribs W-2 through W-6, smear a little Vaseline onto the rod to prevent the wire from sticking, and epoxy the brass tubing to ribs W-2, W-4, and W-6.

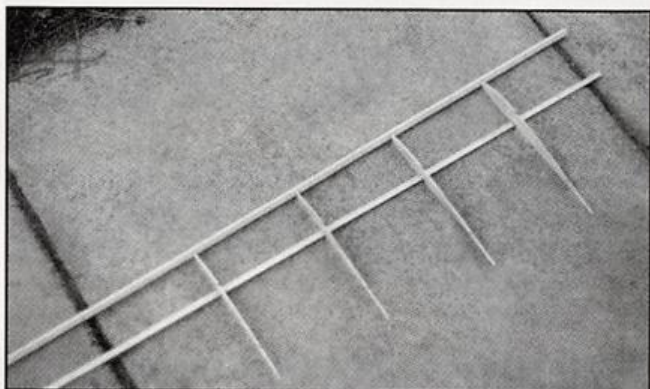
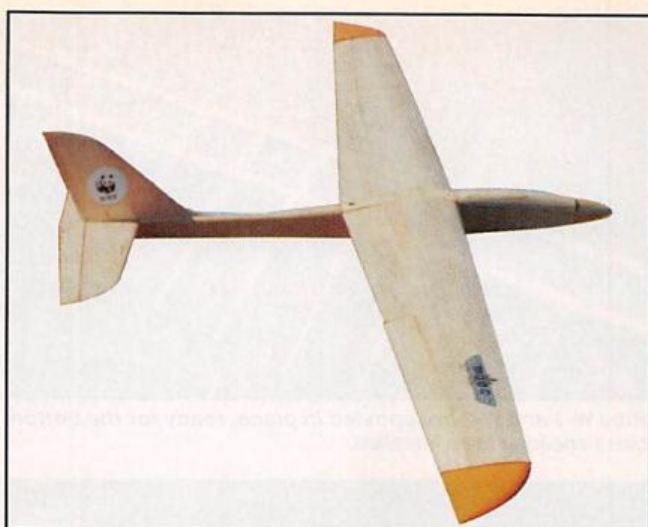
12. Sheet the top of the wing with 1/16" light balsa.

13. Cut the ailerons from 1/2" x 2" x 20" light balsa sheet and carve to the airfoil indicated on the plan. Chamfer the leading edge of the ailerons underneath by

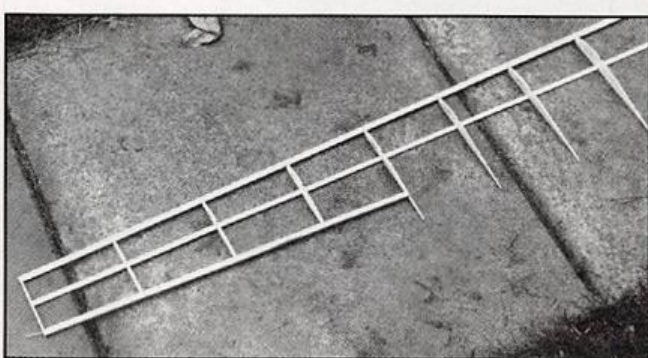
1/8" to allow for deflection when the aileron is hinged at the top. Slot the ailerons for the hinges and the torque rods, then epoxy in place and sand smooth to continue the overall airfoil of the wing.

14. Carve the wingtips from soft balsa, cement in place, and smear a bead of epoxy to the tip and trailing edge of each to help protect the thin surfaces at these points.

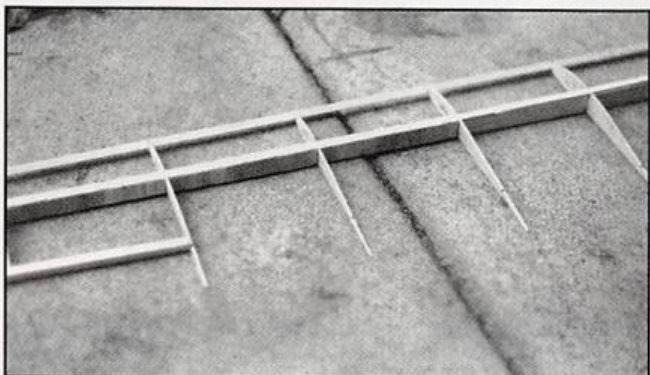
15. Finally, epoxy a 2" wide strip of fiberglass tape to the center section, top, and bottom. This completes the basic wing



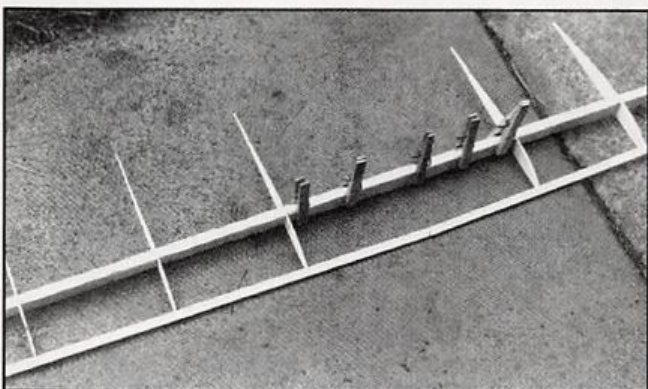
Wing is simple built-up balsa with spruce spars



Aileron spar is added to the basic frame.



The top spar is glued in place and the vertical grain shear webbing is added between ribs.



The two wing halves are joined together at this time using the plywood dihedral braces and epoxy. Clothespins used to hold everything in place until epoxy is cured.

construction.

#### Fuselage:

1. Cut two fuselage sides from Sig 1/8" lite ply. Cut formers F-1 to F-3, drilling and slotting them as shown on the plan.

2. Cement the 1/4" triangular stock balsa to the insides of the fuselage, and epoxy the formers in place. Pull the rear of the fuselage together, trimming the balsa stock to fit, and allow a 1/8" gap at the end for the elevator pushrod.

3. Sheet the bottom of the fuselage with 1/8" ply and 1/8" balsa, laid cross-grained as shown on the plan.

4. Add the balsa block top decking aft of F-3, slot the rear as indicated for the 1/4" fin, and carve the fuselage to that of section A as illustrated.

5. Likewise, carve and sand the hardwood nose block to shape and epoxy to F-1.

6. Carve the balsa canopy using the profiles of the nose block and F-2 as patterns, and drill for the wing retaining dowel.

7. Epoxy the male and female parts of a dress snapper to the canopy and canopy mount respectively, and glue the latter in place immediately behind F-1. Epoxy the 3/16" blind nut into the wing mounting bolt plate, and epoxy this ahead of F-3.

8. Now, position the wing between F-2 and F-3, add the balsa block wing fairings and rough carve to shape.

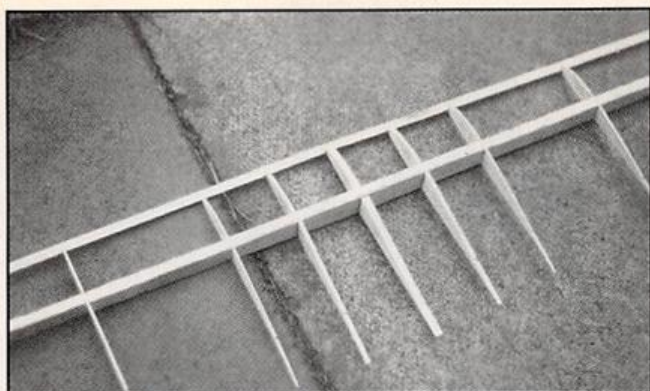
9. Epoxy the 3/16" dia. wing locating dowel into the leading edge of the wing,

then drill the wing for the 3/16" dia. mounting bolt, and bolt the wing to the fuselage. Now carve and sand the wing fairings to conform to the cross section of the fuselage so as to provide a smooth, continuous flow through canopy, wing, and fuselage.

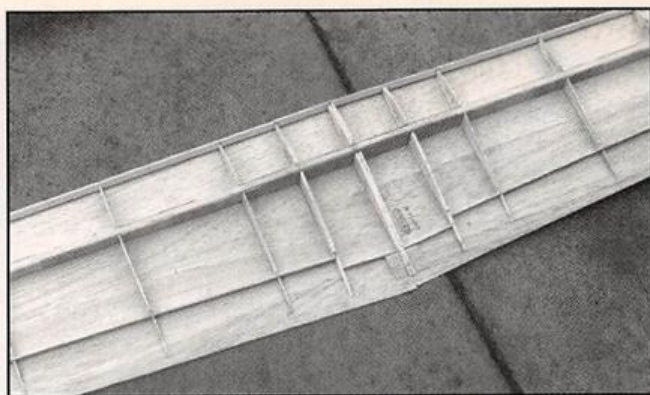
10. Remove the wing and cut the fin, stabilizer, and elevator from hard balsa sheet. Sand to the airfoils indicated on the plan, and epoxy the fin and stab to the fuselage. A bead of epoxy on the thin edges of both the fin and stab will help protect them from rough handling.

#### Finishing:

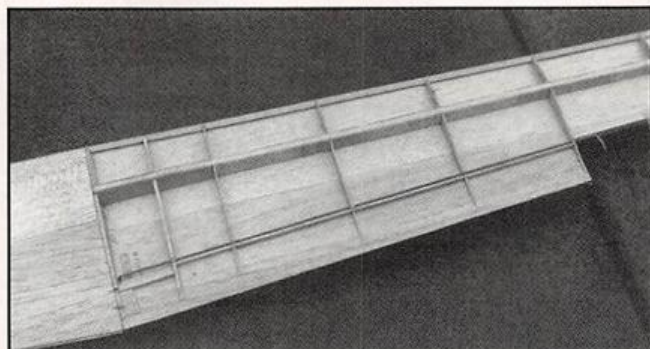
1. Paint or cover the model to your taste, hinging the elevator with a suitable iron-on film and closing the aileron gap



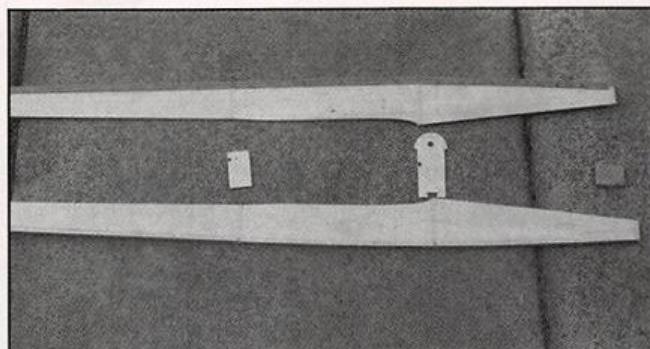
*Ribs W-1 and W-2 are epoxied in place, ready for the bottom balsa sheeting to be installed.*



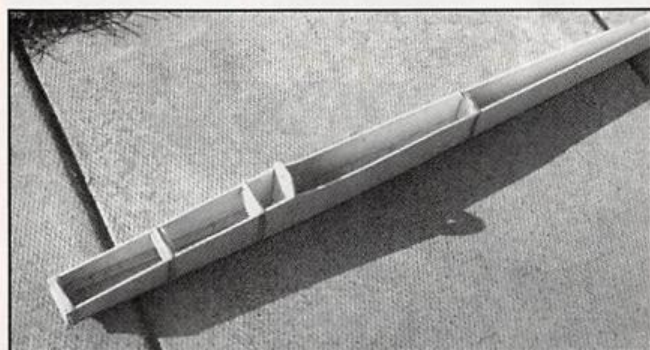
*Bottom wing sheeting glued in place with rear spars and wing bolt blocks also installed at this time.*



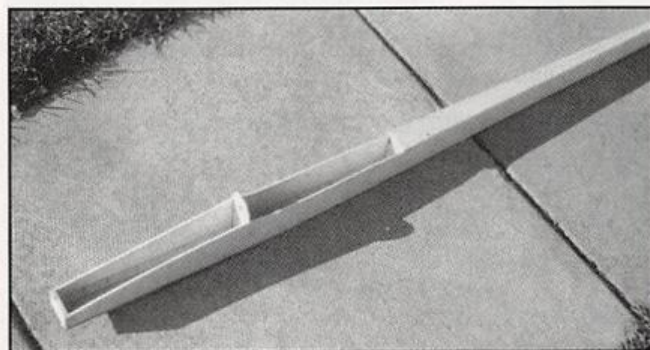
*Left wing panel already sheeted, and right panel ready for sheeting. Note the aileron torque rod and hinges already glued in place.*



*Fuselage sides and formers with triangle stock glued in place, ready to begin assembly.*



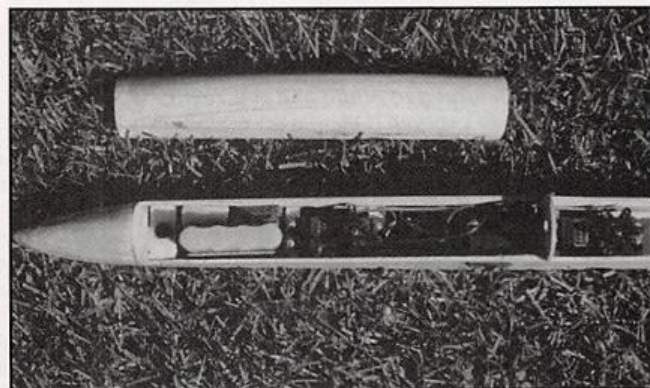
*Fuselage sides are held in place with rubber bands while epoxy cures. Bottom sheeting is already installed.*



*Top rear balsa block glued in place, ready to be shaped.*



*Rear of fuselage shaped and sanded, then slotted for the vertical fin and stabilizer.*



*Finished fuselage showing the basic layout of the radio gear.*

with a similar material.

2. Epoxy the ply tow hook mount to the bottom of the fuselage and add the radio. If you are using standard servos, I recommend mounting the aileron servo in the fuselage immediately behind F-2, cutting the aileron pushrods to length and bending

the servo ends down by 90°, then slipping them into the servo arm as you attach the wing to the fuselage prior to flying. Position the servo so that the bottom of the wing is almost touching the pushrods; this will ensure that the pushrods don't fall out of the servo arm when the model is

inverted! Alternatively, if you intend to fit mini-servos as in the plan, you may choose to install the aileron servo in the wing.

3. Bend and install the elevator pushrod, add a suitable tow hook, balance the model as shown on the plan, and Jaeger is ready to fly.



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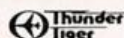
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## Flying:

Set up the servo throws so that the ailerons move up by 1/2" and down by 1/4". The elevator should have about 1/2" movement up and down.

Flying Jaeger off the slope is easy. Pick a good site, a strong breeze, add a little ballast, and launch the model with a slightly nose-down attitude. Keep the speed up, gain some height, and begin cruising the sky.

Thermalling Jaeger off a winch or high start is a little more challenging. Launch the plane with some elevator down-trim to keep the speed up initially; Jaeger's narrow wingtips will stall if you try to steal too much "up" on the launch. The sailplane is not a floater and lacks the wing area a

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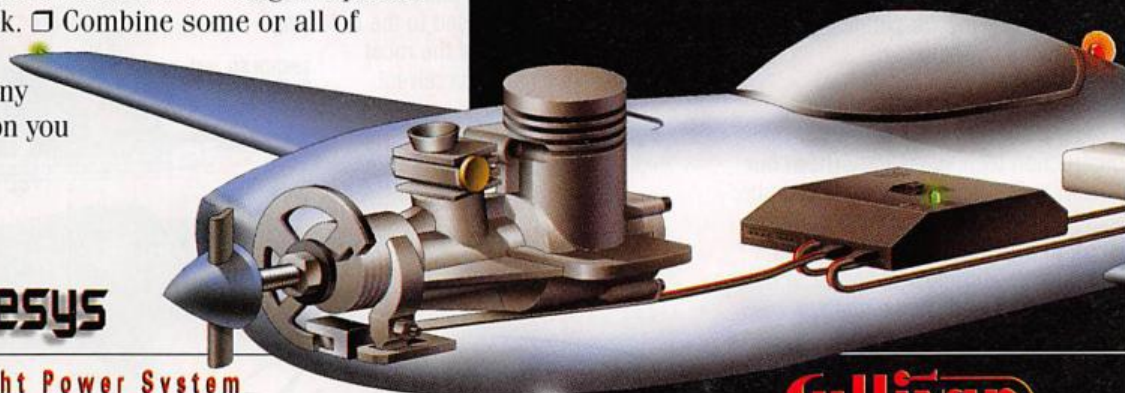
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## Getting Better Ideas Off The Ground.



## JAEGER

Designed by:

Mike Hollison

### TYPE AIRCRAFT

Slope/Thermal Sailplane

### WINGSPAN

92 Inches

### WING CHORD

7 Inches (Avg.)

### TOTAL WING AREA

600 Sq. In. (Approx.)

### WING LOCATION

Shoulder Wing

### AIRFOIL

Flat Bottom

### WING PLANFORM

Double Taper

### DIHEDRAL, EACH TIP

2 Inches

### OVERALL FUSELAGE LENGTH

39-3/4 Inches

### RADIO COMPARTMENT SIZE

(L) 13" (W) 2-1/4" (H) 1-1/2"

### STABILIZER SPAN

24 Inches

### STABILIZER CHORD (inc. elev.)

4-1/2 Inches (Avg.)

### STABILIZER AREA

100 Sq. In. (Approx.)

### STAB AIRFOIL SECTION

Flat Bottom

### STABILIZER LOCATION

Top Of Fuselage

### VERTICAL FIN HEIGHT

7-1/2 Inches

### VERTICAL FIN WIDTH (inc. rud.)

5-1/2 Inches (Avg.)

### REC. NO. OF CHANNELS

2

### CONTROL FUNCTIONS

Elev., Ail.

### C.G. (from L.E.)

2-3/4 Inches (At Fuselage)

### ELEVATOR THROWS

1/2" Up — 1/2" Down

### AILERON THROWS

1/2" Up — 1/4" Down

### BASIC MATERIALS USED IN CONSTRUCTION

Fuselage ..... Balsa & Ply

Wing ..... Balsa & Spruce

Empennage ..... Balsa

Wt. Ready To Fly . . . 56 Oz. (3 Lbs., 8 Oz.)

Wing Loading ..... 13.4 Oz./Sq. Ft.

Continued from page 69

standard glider has, therefore, staying in and climbing with a thermal takes a little extra eye and hand coordination. Also, getting your model to fly at its optimum

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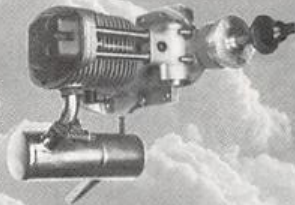
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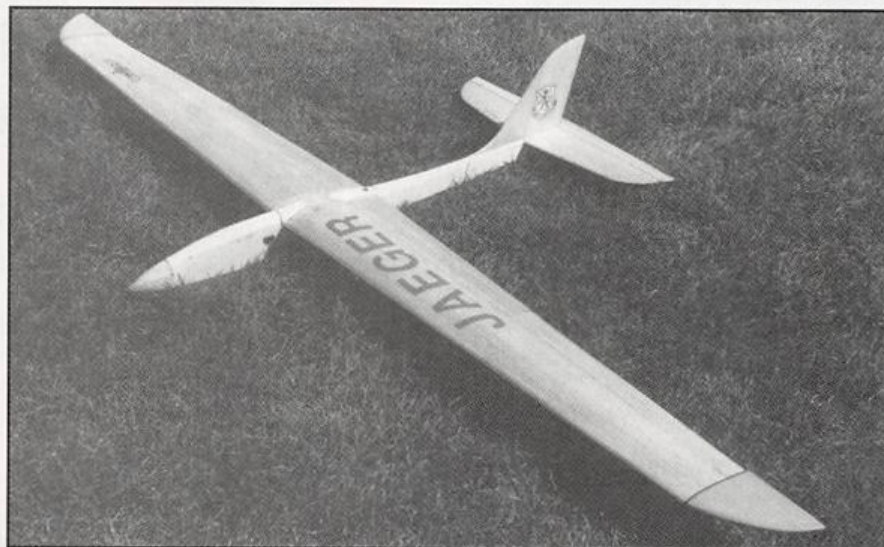
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Completed model with empennage, wingtips, and carved balsa canopy, and wing fairings.

performance level may involve experimenting with weight and trim settings, depending on the weather conditions, thus preparing the pilot for more advanced F3B-type designs.

So, make Jaeger your first (or next) aileron ship and test yourself while you have some fun!



## ROBIN'S HOBBY

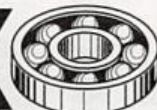
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