



# CLOUD KITTEN

## .15 Powered Sport Flier

*By Fred Reese*

Everyone should have a little airplane like the Cloud Kitten. It just took a long time before I got around to building one. Many years ago, Harry Stewart, in Nevada City, CA, designed and built a similar little model called "Number Seven." It was his seventh design and many people built them. In fact, it became the standard fun fly model of the region back in the early 80's. Actually, at the time, I really didn't need to build one because Harry always had his, and would let us all fly it. We flew it on floats from a pond and we flew it on skis from the snow. We flew it anywhere and anytime. The Cloud Kitten is my version of that airplane, trying to embody all the things that made the Number Seven great.



# Back To Basics With A Spirited Little .15 Powered, 3-Channel Airplane Designed To Be Flown Anywhere, Anytime.

Usually, I need some motivation to build a new airplane. Our local R/C club had scheduled a night fly and a cross country run for this summer. I did not want to fly my other models in these events so I thought again of Harry's "Number Seven." I did not have the plans for a Number Seven, but I could have called Harry for a set. Instead, I scaled up my drawing of the "Cloud Kitten," a .020 powered free flight that I built last year. Computers are really wonderful for that sort of thing. Funny, but the Cloud Kitten ended up looking a lot like a Number Seven.

The Cloud Kitten is a basic, lightweight, 3-channel model designed specifically for .15 engines. Engines such as the Thunder Tiger, O.S., Magnum, Enya, and Fox are perfect. Do not be tempted to use a Rossi or other racing .15 engine. Also, do not be tempted to use an engine larger than a .15, it is just not needed nor is the model stressed for more power. But, don't be misled, a Thunder Tiger .15 turns the Cloud Kitten into a rocket ship, and a .10 will fly the model nicely. Depending on the radio system used, the Cloud Kitten should weigh between 2-1/4 and 2-1/2 lbs.

The best thing about the Cloud Kitten is the flying. While not aerobatic like an Extra, it will still loop and roll, do Cubans and a fair hammerhead. Landings and touch and go's are the best. Sometimes I spend the whole flight doing touch and go's flying in a tight circle. The rudder, when combined with lots of dihedral, gives a very positive roll response without ailerons. I mixed rudder and ailerons on the transmitter so that rudder control can be made from either or both sticks. Mixing helps during take-off and landing, as I am used to steering with my left hand at these times. Either stick gives the full movement of the rudder. Now I just fly as if there were separate controls using both hands and the model does not know the difference.

I mentioned night flying at the beginning. The Cloud Kitten is an ideal model for night flying, but the light system that I used was not. I had intended to show the lights because they looked great on the ground and at night. However, they did not give adequate

definition to the flight attitude and I was easily disoriented. I flew the Cloud Kitten four times between late dusk and full dark, and as long as there was some light to see the airplane, all was well. The flashing lights looked terrific inside the transparent covered wings but were confusing when it got really dark, as there was no moon. I had flashing lights inside the wingtips and another flashing light imbedded in the leading edge of the wing at the tips. I figured I would be able to see the model overhead and coming towards me. I had a non-flashing light on the top of the rudder. Based on the other models that flew, I had the configuration right, but not the right lights. The system that worked best was three different colored, cyalume, light sticks. A red or orange light stick on one wingtip, a green on the other tip, and a yellow or blue on the rudder gave the model adequate definition for comfortable flying. It was important to have the lights extend out past the tips so they could be seen in all attitudes.

## CONSTRUCTION

### Fuselage

Begin the fuselage construction by cutting out and assembling the two fuselage sides. The bottom of the side is cut from 3" sheet with the cabin sides glued on. I use Zap-A-Gap, CA+ for all of the fuselage construction. Glue on 3/32" balsa doublers with the grain running vertical to the sides. Leave slots for the bulkheads between the doublers. Also, note there is a notch in the doubler, behind F-2, for the landing gear mount. There is also a slot in the doublers for the servos. This makes it easier to locate the servo rails and gives a little more room in that area for the servo output arms.

Cut the firewall, F-1, and the landing gear mount from 3/16" or 1/4" aircraft plywood. Install the engine mount to F-1, using the plan side view as a guide. Use 4-40 bolts and blind nuts to bolt the engine mount to F-1, then temporarily install the engine to the mount using the screws provided with the mount.

Cut the two bulkheads, F-2 and F-3, from 1/8" lite ply. Glue the bulkheads to one of the fuselage sides, in the slots between the doublers, using a square to keep them perpendicular to the sides. Glue the second fuselage side to the

## CLOUD KITTEN

Designed by:

Fred Reese

### TYPE AIRCRAFT

Sport Trainer

### WINGSPAN

48 Inches

### WING CHORD

8 Inches

### TOTAL WING AREA

384 Sq. In.

### WING LOCATION

Top of Fuselage

### AIRFOIL

Flat Bottom

### WING PLANFORM

Constant Chord

### DIHEDRAL, EACH TIP

3 Inches

### OVERALL FUSELAGE LENGTH

37 Inches

### RADIO COMPARTMENT SIZE

(L) 8" x (W) 2-5/8" x (H) 4"

### STABILIZER SPAN

16 Inches

### STABILIZER CHORD (inc. elev.)

4-1/8 Inches (Avg.)

### STABILIZER AREA

67 Sq. In.

### STAB AIRFOIL SECTION

Flat

### STABILIZER LOCATION

Top of Fuselage

### VERTICAL FIN HEIGHT

5-3/8 Inches

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

3-3/8 Inches

### REC. ENGINE SIZE

.10-.15 Cu. In.

### FUEL TANK SIZE

2-4 Oz.

### LANDING GEAR

Conventional

### REC. NO. OF CHANNELS

3

### CONTROL FUNCTIONS

Rud., Elev., Throt.

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

2-1/2 Inches

### ELEVATOR THROWS

3/8" Up - 3/8" Down

### RUDDER THROWS

3/8" Left - 3/8" Right

### SIDETHRUST

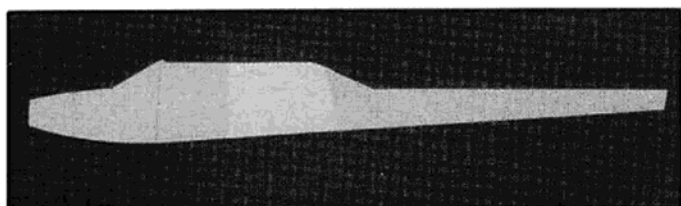
0-2° Right

### DOWTHRUST/UPTHRUST

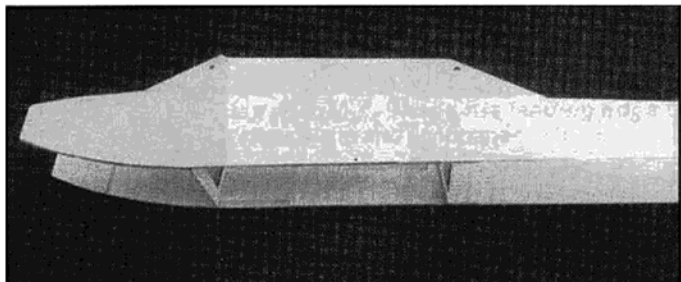
5° Downthrust

### BASIC MATERIALS USED IN CONSTRUCTION

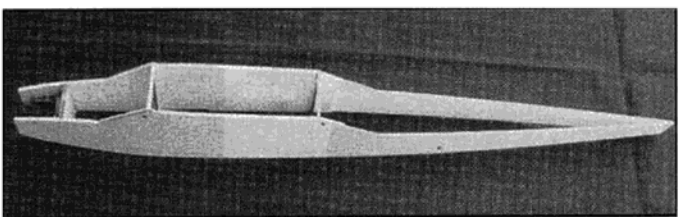
Fuselage ..... Balsa & Ply  
Wing ..... Balsa & Ply  
Empennage ..... Balsa  
Wt. Ready To Fly .... 36 Oz. (2 Lbs. 4 Oz.)  
Wing Loading ..... 13-1/2 Oz./Sq. Ft.



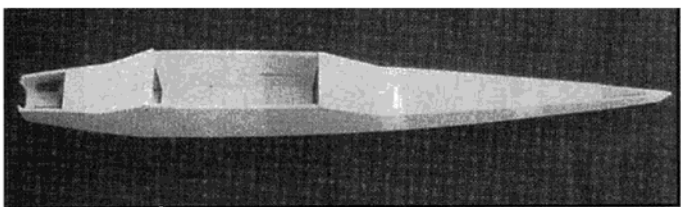
Cut the fuselage sides from 3/32" balsa. Glue the 3/32" balsa doublers to the sides, leaving slots for the bulkheads and the landing gear mount. Make a right and left side.



Glue bulkheads F-2 and F-3 to one of the fuselage sides. Glue on the second side.



Pull the fuselage sides together at the tail and glue. Epoxy F-1 between the fuselage sides in the slots. Hold the nose together with a rubber band until the epoxy sets. Adjust the rubber band while the epoxy is soft to straighten the fuselage.



Glue on all of the top and bottom 3/32" balsa sheeting. Leave a space for the aluminum landing gear between the sheeting on the bottom. With the engine in place, glue on the spinner ring to the front of the fuselage and add the triangle stock in the corners.

bulkheads, positioning the second side to the bulkheads the same as the first to avoid a twist in the fuselage.

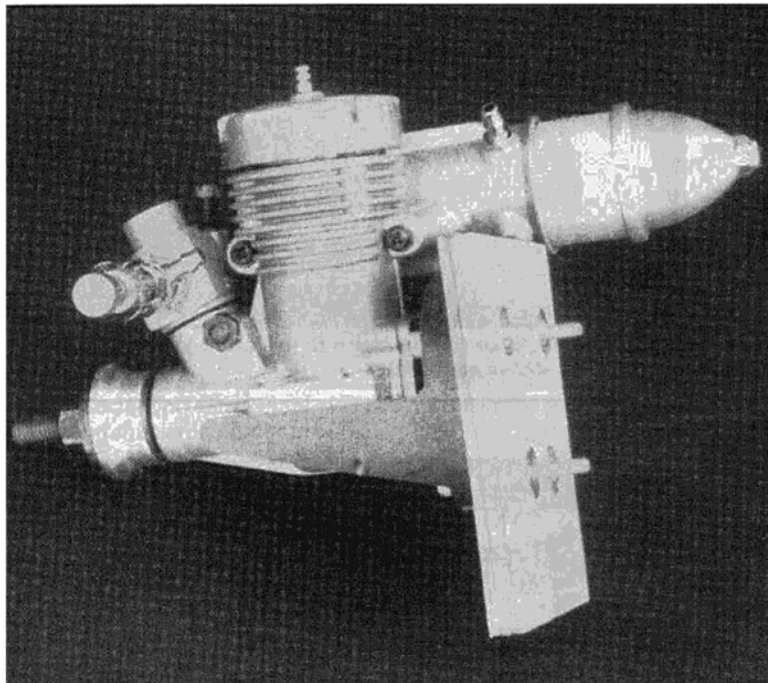
Pull the two fuselage sides together at the tail and glue. Make sure the ends of the sides are even with each other. Epoxy F-1 between the two sides in the slots between the doublers. Hold the sides together with a large rubber band and adjust the tension to ensure the fuselage is straight and F-1 is not angled to either side.

Bevel the tops and bottoms of the bulkheads to be even with the fuselage sides. Epoxy the plywood landing gear block in place behind F-2 and glue the triangle stock in place over the landing gear block. Sheet the top and bottom of the fuselage with 3/32" balsa sheet. Note the plywood tail wheel bearing the last two inches of the bottom sheeting.

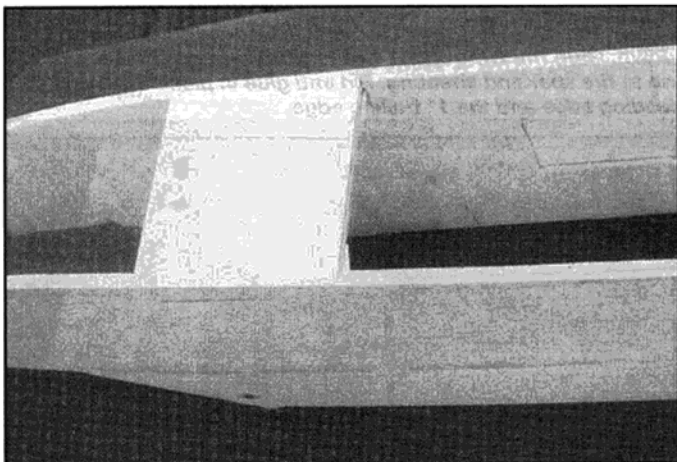
With the engine in place, fit the lite

ply spinner ring to the front of the fuselage to align with the spinner. Leave a 3/32" gap between the back of the spinner and the spinner ring. Glue in the triangle stock corner fillers, then carve and sand the nose to fair into the spinner.

Cut and assemble the 1/8" balsa vertical fin and horizontal stabilizer. Sand the leading edges round and leave the back edges square. Mark a centerline on the top of the stabilizer for alignment. Glue the stabilizer to the fuselage. Glue the fin to the top of the stabilizer and fuselage using a square and the centerline as a guide. Cut and fit the 1/8" balsa rudder and elevator. Bevel the leading edges of the rudder and elevator and round off the trailing edges. Sand the fuselage and tail with 220 grit sandpaper. Fill any dents or holes with vinyl Spackle filler. Drill the two 3/16" dia. holes for the wing mount dowels. The fuselage is



Thunder Tiger .15 shown mounted on a Dave Brown 1519 engine mount. The engine mount is bolted to F-1 with 4-40 bolts and blind nuts.

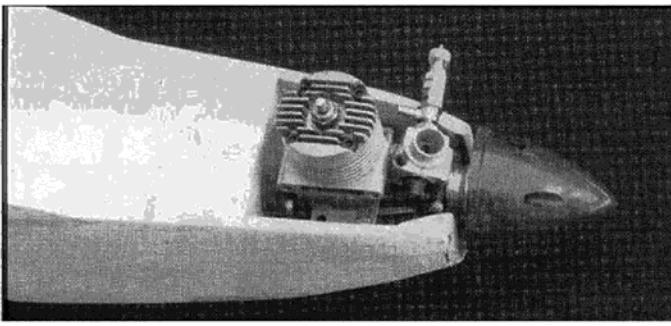


Epoxy in the 3/16" ply landing gear mount and add the 1/2" triangle stock above the plywood.

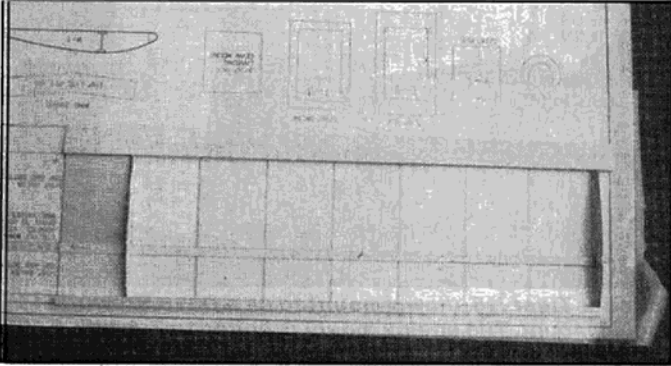
ready to cover. Cover it. I used black UltraCote for the windows, as it does not bubble when ironed on over other covering. The pink trim, name, and numbers were cut from UltraCote Plus using my new Stika II vinyl cutter. See the September '98 issue of *RCM* for a product review. I recommend spraying a protective coat of clear gloss polyurethane over any lettering or cut trim to prevent the edges from loosening with time and oil.

### Wing

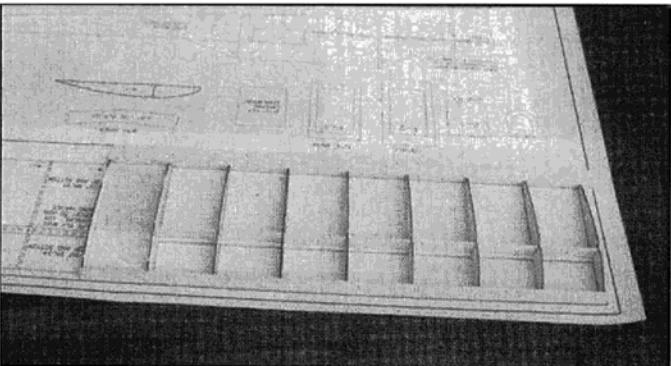
Cover one side of the wing plan with waxed paper over a building board. Pin the bottom 1/8" x 3/8" hard balsa wing spar in place over the plan. Glue and pin in place the bottom 1/16" balsa sheeting. The two W-1 ribs will be glued on top of the sheeting. Glue the W-1 end rib in place, using the rib angle guide and pin it in place. Glue the wingtip W-2 rib in



**Shape the front of the fuselage to match the spinner and add filler blocks where necessary.**



**Pin the 1/8" x 3/8" hard balsa bottom spar to the plan over waxed paper and glue on the 1/16" balsa bottom sheeting and pin it down. Glue the wingtip rib W-2 to the spar and the second W-1 rib to the spar and sheeting. Pin and glue in place the 3/8" x 1/2" leading edge and the 1" trailing edge.**



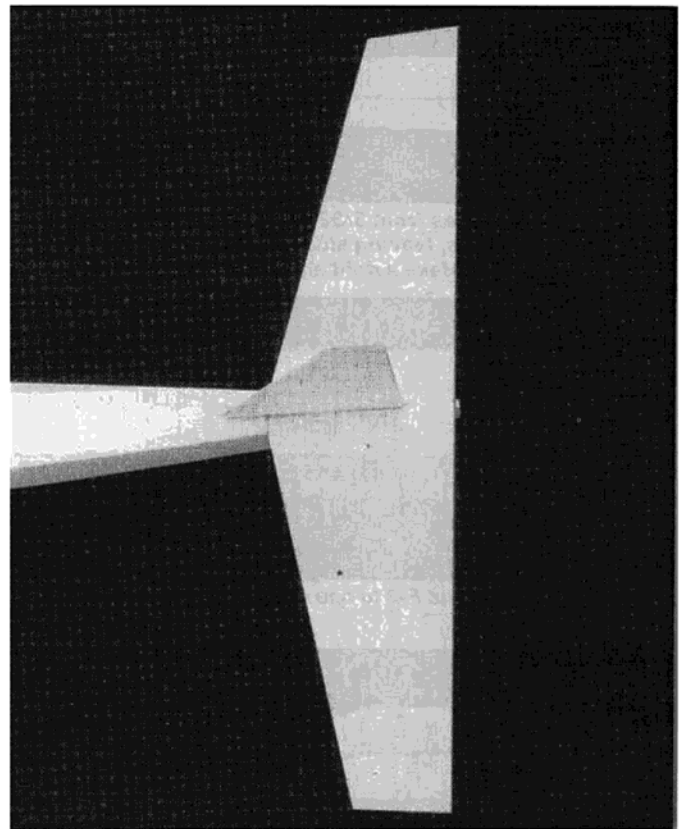
**Glue the rest of the ribs in place. Use the rib angle guide to set the angle of the wing center, W-1 rib. Glue in place the 1/16" x 3/4" balsa shear webs between the ribs. Do not glue a shear web between the two W-1 ribs. The dihedral brace will fill this space.**

place and pin it down. Glue the 1" tapered trailing edge to the two ribs and pin the trailing edge to the plan. Glue and pin in place the 3/8" x 1/2" leading edge to the two ribs. Glue in the rest of the ribs. I use Zap thin CA to glue the ribs to the spars and Zap-A-Gap for the rest of the wing construction. Glue the top 1/8" x 3/8" balsa wing spar into the top notches of the ribs.

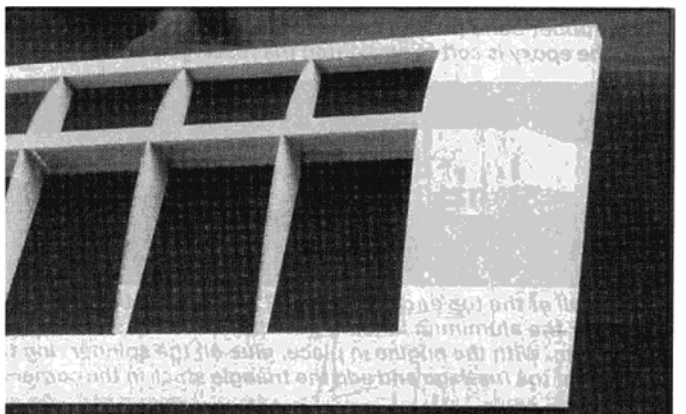
Glue 1/16" x 3/4" balsa shear webs

between the ribs and the spars except between the two W-1 ribs. That will be filled by the dihedral brace. Normally, the shear webs should be vertical-grained, but in the case of this lightly loaded model, I believe the strips to be adequate, but choose medium to hard wood for the shear webs.

Cut, fit, and glue in place the top, center section, 1/16" balsa sheeting. Trim the ends of the wing panel and glue on the 3/16" balsa wingtips. Plane and sand the leading edge to match the plan. Glue a 2" length of 1/8" dia. dowel into the trailing edge at the root end to reinforce the trailing edge to protect it from the rubber bands. The first wing panel is complete. Build the second wing panel, following the same procedure as the first



**Glue the stabilizer and fin to the top of the fuselage and prepare for covering.**

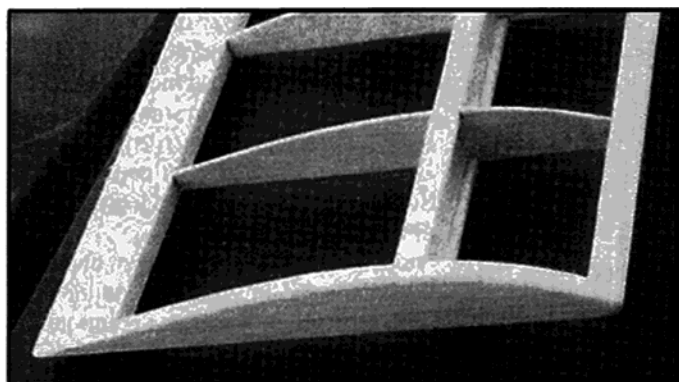


**Glue in the top, 1/8" x 3/8" hard balsa spar in the rib notches. Fit and glue on the top 1/16" balsa sheeting over the two W-1 ribs.**

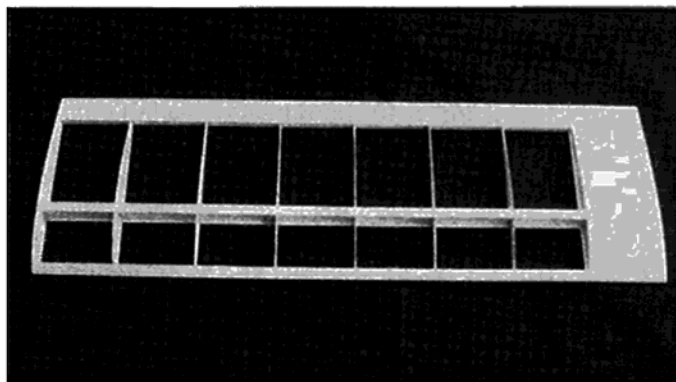
over the other side of the wing plan.

Cut away a 3/16" slot between the spars of the end W-1 ribs of each wing panel for the dihedral brace. Trial-fit the dihedral brace into the slots and the two wing panels together. Make any adjustments necessary for a good fit between the two wing panels. Epoxy the two wing panels together with the dihedral brace first epoxied into one of the panels. Block up one wingtip 6" as shown while the epoxy cures. After joining the two wing panels, balance the wing, side to side, before covering. Mine needed a sliver of lead glued inside one of the tips to balance the wing. Finish sanding the wing and cover with your favorite colored film. I like yellow.

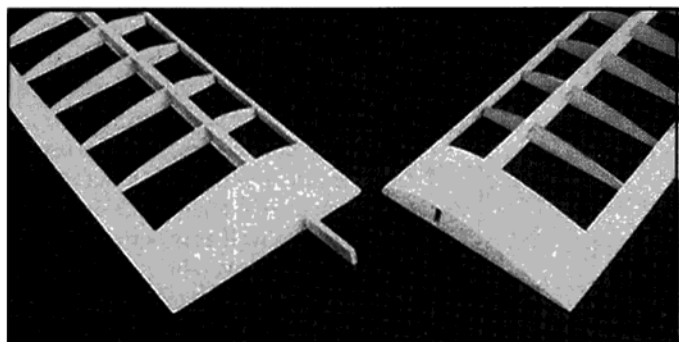
Mount the landing gear with two 6-32



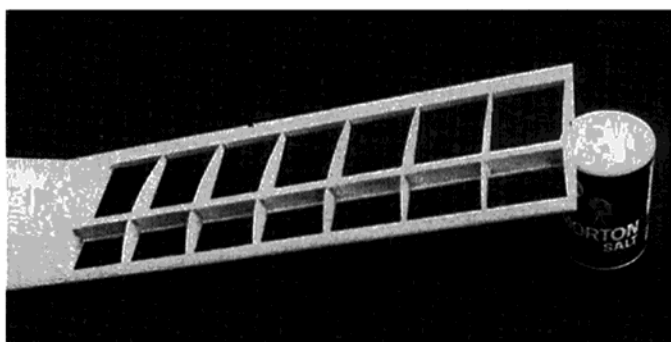
*Glue on the 1/8" balsa wingtips. Shape the leading edge to match the plan with a razor plane and sandpaper.*



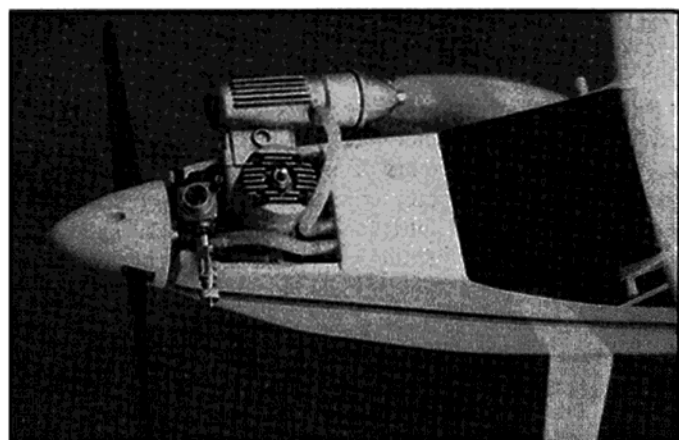
*Build the second wing panel over the other side of the wing plan following the same procedure.*



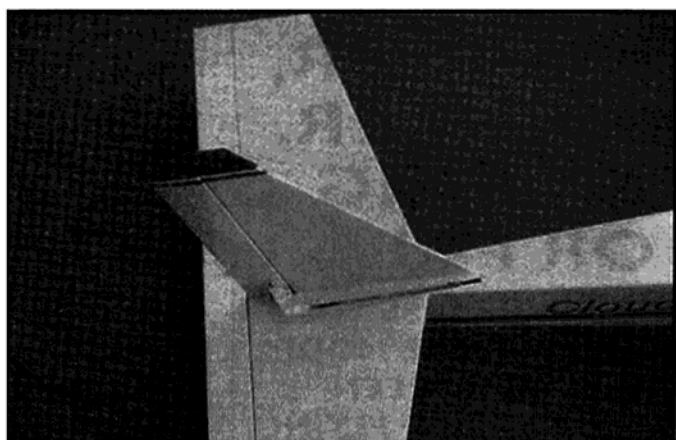
*Cut 3/16" wide slots in the center W-1 ribs between the spars for the dihedral brace. Epoxy the 3/16" plywood dihedral brace into one of the wing panels.*



*Epoxy the two wing panels together, blocking up one wingtip 6". Sand the model and cover it with your favorite colored film.*



*Finished engine installation showing the fuel lines passing to the left of the engine.*



*Finished rudder and elevator showing the rudder pushrod exiting, with a little jog, through the top of the fuselage.*

bolts and blind nuts. Bend the tail wheel wire as shown on the plan and install the bottom wheel collar before making the final bend at the top. Be sure the axle portion of the wire is 90° to the rudder end before installation. The wheel collar keeps the landing impact away from the rudder. Locate and drill the 1/16" dia. hole in the plywood bottom piece for the tail wheel wire and also drill an elongated hole through the stabilizer at the base of the fin. Wiggle the tail wheel wire up through the fuselage and out the top. Mark the rudder where the wire will be, and drill a 1/16" dia. hole into the rudder for the tail wheel wire. Cut the hinge slots in the fin and rudder and install the hinges. I used Easy Hinges cut in half for both the rudder and

elevator. The plan shows the size and location of the hinges. Slip the hinges and wire into the rudder, and glue. The wheel collar should be up against the bottom of the fuselage. Hinge the elevator to the stabilizer.

The wheel pants are optional, but I like the way they look. I made the pants from 7/8" soft balsa cut to the shape shown on the plan. The outboard side of the pants is covered with 1/8" balsa and the inboard side is 1/8" aircraft plywood (bottom 1") and 1/8" balsa. Rough cut the top profile of the pants with a razor saw. The rest is a coarse sanding block, followed by 100 grit and 220 grit hand sanding. Cover the pants with film. The wheel axles are 6-32 x 1-1/4" bolts (1" if pants are not used) secured with a nut on

each side of the aluminum landing gear. The wheels must be drilled 5/32" to fit over the bolts. The plywood side of the wheel pant is sandwiched between the nuts and the landing gear. I used socket head bolts and buried the heads in the 1/8" balsa side by drilling first with a 3/16" bit.

Make the pushrods with some extra length at the servo ends. I use 1/4" sq. balsa pushrods with the wire bound and

**Editing By Hisat.  
RCModeler  
Nov. 1999.**

## CLOUD KITTEN MATERIAL LIST

5	3/32" x 3" x 36" balsa	fuselage
2	1/8" x 3/8" x 48" hard balsa	wing spars
1	1/16" x 3/4" x 48" balsa	wing shear webs
1	3/8" x 1/2" x 48" balsa	wing leading edge
1	1" trailing edge x 48"	wing trailing edge
3	1/16" x 3" x 36"	wing ribs and sheeting
1	1/8" x 3" x 48"	empennage and wingtips
1	3/16" ply. 6" x 12"	F-1, landing gear mt., wing joiner
1	1/8" lite ply. 6" x 12"	bulkheads
1	1/4" sq. x 36" balsa	pushrods
1	3/32" ply. 1" x 2"	tailwheel support
1	3/16" dowel x 10"	wing mount

### Hardware

1	Sig landing gear RPBA-236
1 pr.	1-3/4" wheels
1	3/4" tailwheel
1	Dave Brown 1519 engine mount
1	1/16" x 36" wire
2	threaded pushrods and clevis
3	small control horns
6	hinges
2	1/16" wheel collars
7	4-40 x 1/2" bolts and blind nuts, 1-1/4" if using wheel pants
2	6-32 x 1" bolts and 4 nuts
1	roll covering plus trim colors

## SUMMER, WINTER, SPRING, OR FALL...

**NOW IS THE SEASON  
TO BUILD THE MODEL  
YOU'VE BEEN  
DREAMING OF FLYING.**

**SEE PAGE 181 FOR CLOUD KITTEN  
AND OTHER GREAT PLAN LISTINGS.**

Zapped in place. The ends of the wire are bent and pushed into the balsa as shown on the plan. Cut the slots in the fuselage for the pushrods and install the pushrods. Attach the clevis' and control horns to the pushrods, and then adjust the wire and bolt the control horns to the rudder and elevator. Drill a 3/32" dia. hole through F-1 and F-2 for the 1/16" dia. wire throttle pushrod. A "Z" bend attaches the pushrod to the engine throttle arm.

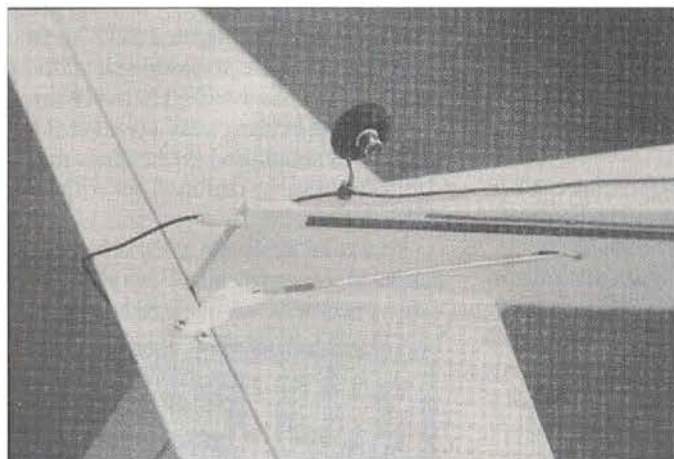
Assemble the fuel tank so that the tubes pass through the firewall above the engine mount and to the side opposite to the muffler. See the engine

photo. Drill two 5/32" dia. holes through F-1 for the brass fuel tubes. I prefer to pass the brass fuel tubes through the firewall on smaller models. Install the fuel tank, throttle pushrod, and engine with propeller and spinner. Support the fuel tank with foam rubber or bubble pack.

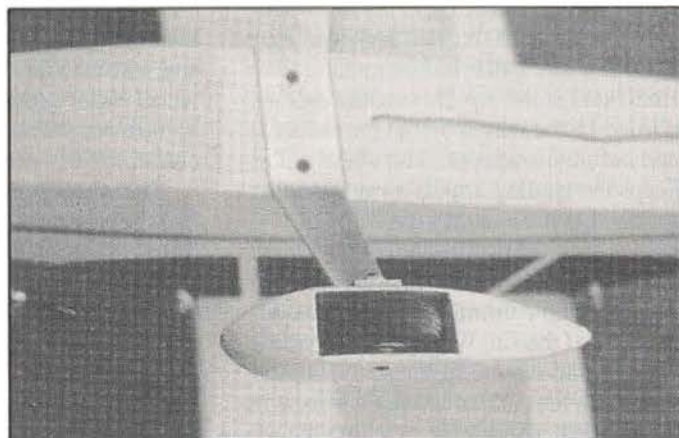
Before installing the radio, check the balance point. Attach the wing with rubber bands and support the model under the wing spars. Place the servos, receiver, and battery pack in their relative positions on top of the model and adjust the positions until the model hangs level. With this information in mind, install the servo rails and mount the servos and switch harness. Hook up the pushrods to the servos using "Z" bends or EZ connectors. I always use EZ connectors on the throttle servo. I usually use the EZ connectors on the other servos as well as on small models like this. Add any weight, if necessary, to balance the model where shown on the plan. Adjust the control throws for 3/8" right and left rudder and 3/8" up and down elevator.

### Flying

Install an 8 x 4 prop on a .15 and a 7 x 4 on a .10 engine and adjust the engine for the lowest possible reliable idle. The low idle will make the landings much easier. The Cloud Kitten takes off easily with just slight rudder corrections. Be sure to point it straight into the wind for take-off. The Cloud Kitten responds to rudder like another model would to ailerons. The roll rate is positive and it will do consecutive rolls as if it had ailerons. Just go fly it. The Cloud Kitten is predictable and easy to fly. It is also responsive and a great change-of-pace model that is versatile and a lot of fun.



1/16" tail wheel wire passes through the fuselage into the rudder. The wheel collar against the plywood tail wheel bearing absorbs the loads of landing. A piece of yellow fuel tubing with a piece of toothpick secures the receiver antenna.



Wheel pants start with a 7/8" light balsa core, cut on the Dremel jig saw. The outsides of the pants are 1/8" balsa and the insides are 1/8" plywood. The axle is a 6-32 x 1-1/4" bolt with two nuts holding the pant to the landing gear. The pants are held firmly to the aluminum landing gear, but will turn if bumped.