

# Pou Du Ciel (THE FLYING FLEA)

By RANDY WRISLEY . . . Whether you call it Pou-du-Ciel, Flying Flea, Sky Louse, or H.M. 14, it's still an attractive "bug" of an airplane. Originally designed in 1934 by Henri Mignet, hundreds of "Pous" were built.

• I guess I'm just one of those guys who roots for the underdog. I built this scale model of the HM-14, just to see if all the horror stories I had heard about it were true. Using my junkiest engine, and oldest radio, I proceeded to construct what you see in the pictures in two days!

Boy, was I surprised when this little bug flew so well! It's stable and easy to fly. It's a pussycat on the ground. When I tried to get it to tuck under, it would get to 90 degrees and stop. A touch of up elevator brought instant recovery, usually with a loop. Oh, by the way, I used Henri's original form of control, and pivoted the main wing for elevator!

My first trip out to Mile Square (a very popular Southern California flying site) had many of the regulars there worried. As I fiddled with my junky engine, the

braver modelers would walk by and ask if it had flown before. Most were amazed when they saw the wing pivot. As I walked to the runway for the "first" flight, modelers moved their belongings to the shelter of their cars for safety.

The little Flea ran arrow-straight down the runway, hopped into the air, and made several happy circuits of the field. I took it up a ways and let a friend fly it who had no time on powered models, only gliders. He had a ball! Like its full-size counterpart, the Flea won't stall in normal flight attitudes, and it won't spin. Needless to say my buddy had no trouble! When the engine quit, I glided down to a perfect landing and was surprised to hear a round of applause! Hurrah for the underdog!

As you gather the materials to build

yours, you should be aware of two things. First off, keep the tail light. Finally, don't be tempted to over-power it. It flies just fine at 32 ounces with an Enya .09, swinging a 9-4 plastic prop. Read on McDuff, and we'll build yours.

## FUSELAGE

Select a soft piece of 3/32 by six inch balsa. Carefully cut two sides to shape. Don't mark on the aft ends of the sides as they will break when you try to bend them. Cut the formers from the material indicated.

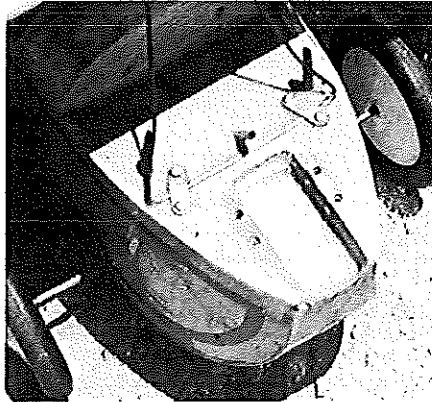
Install the 1/8 x 1/2 inch bearing blocks for the joystick, and drill the 5/32 holes for the brass tube before you assemble the structure. Bend up the cabane struts from 3/32 music wire. Attach it to former "C" with Sig landing gear clamps. The 1/8 inch landing gear wire is also held in place on former "B" with landing gear clamps.

Assemble the fuselage by installing former "D". Pull the tail together and Hot Stuff it lightly in a couple of spots.

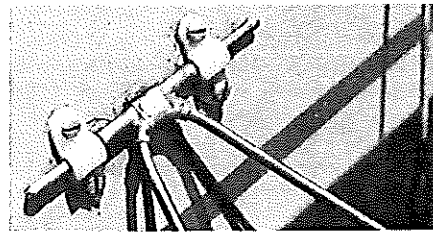
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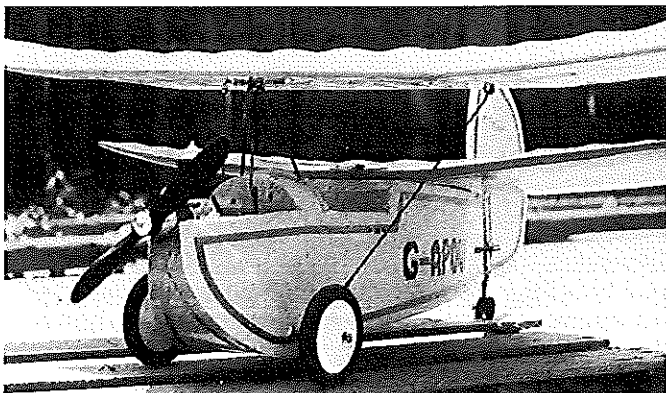
These twin tail wheels are from an old Comet kit, but can be turned on a wood lathe also.



Flying Flea model has simple engine mount. Forward part of cabane assembly visible.



Front cabane assembly as it meets top wing. Wing is free to pivot for "elevator" effect.



Almost ready to fly, the Flying Flea waits for one more photograph. Engine installation is neat and simple . . . cute, too!



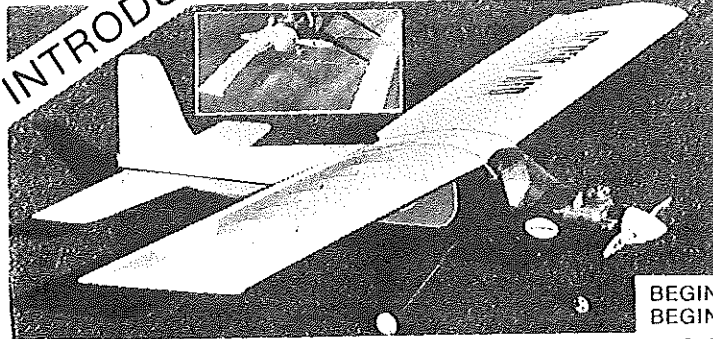
Side view of the Flooing Fly . . . er, Fleeing Floo . . . you know! Elevator pushrod clearly seen here. Darned unusual aircraft!



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should do the trick.

—Jake

★ ★ ★

Dear Jake:

I know you like to kid around a lot, but I've got a legitimate question, and I would really appreciate it if you could give me a legitimate answer. How do you design the landing gear for a new airplane.

—Sincere in Seattle

Dear Sincere,

With the airplane in an upright position, the landing gear should extend all the way from the bottom of the airplane to the ground.

—Jake

★ ★ ★

Dear Jake:

Very funny, but you know that's not what I meant. What I want to know is how do you locate the landing gear on a new design?

—Still Sincere in Seattle

Dear Still Sincere:

Turn the airplane upside down and look for those little wire things with the wheels on them. That's the landing gear.

—Jake

(Editor's note: Send your questions to "Dear Jake" care of Model Builder magazine, P.O. Box 10335, Costa Mesa, CA 92627.)

## Flying Flea...Continued from page 26

Soak the outsides of the fuselage between D and the tailpost with water sprayed from an old Windex bottle.

Now carefully pull the sides together and Hot Stuff "B" in place. Epoxy former "C" in place, taking care to get the angle correct. Next comes "A", again epoxied and carefully aligned. Hot Stuff the balsa block front deck on and carve it to shape.

The Perfect No. 13 tank is modified as shown and installed with wood screws. If you can find some solder lugs, these can be used instead of brass strips for mounting. Hot Stuff A-1 in place. Install the blind nuts for your engine mount, and build a box under the engine to prevent fuel from getting inside the fuselage.

Cut the nose pieces to shape noting the grain direction and Hot Stuff them in place. If you haven't already done so, install the tailpost, rear wing hold-downs, and the spruce cockpit stiffeners. Plank the top and bottom with 1/16 balsa, applied cross-grain. The nose is planked with 1/32 ply as it takes a beating.

You can clamp the forward part of the cabane assembly to the top of "A", but don't solder it to the other cabane strut until we align the wings. You can now sand the fuselage smooth, slip the wheels on, and set it aside.

### RUDDER

You can build up the rudder if you like, using a laminated outline, or do as I did and cut it from 1/8 light balsa. The twin tailwheels come from old Comet kits. Solder the assembly as shown and attach it to the rudder with Hot Stuff. A piece of nylon reinforcing tape Hot Stuffed over the installation will make it much stronger.

### WINGS

As both wings are built almost alike, we will cover building them together. First, make templates and cut out all the ribs, noting the rear wing rib is different. Now, build both spars flat on the board. When dry, sand the main spar up in position over the plane and install the ribs in the center section. Follow with the leading edge and trailing edge.

(Note: the trailing edge of the rear wing is installed upside down.) Now we add the ribs out to the wing tip. Put the last one in first, Hot Stuff the precut leading edge and trailing edge pieces to it, then install the rest of the ribs. Believe me, it sounds a lot more difficult than it is! Add the wing tips, and a couple of blanks you will later sand to the tip rib shape. Pick the wing off the board and add the 1/8 x 1/8 rear spar. This is a soft, one-piece spar, bent into place. Epoxy the spruce hold-downs and plywood plates at the locations shown for the wing you are working on. Sand the leading edges round, and get ready to install them on the fuselage.

### INSTALLING THE WINGS

Carefully square the rear wing on the fuselage. Mount it with two screws at the front spar, and one at the rear spar. Bind the 1/8 brass tube to the front cabane assembly. Run a 36 inch piece of 3/32 music wire through the tube and carefully align it to the rear wing before you solder the parts together. Mount the front wing with sheet metal screws and confirm that you did a good job.

### RADIO INSTALLATION

Build up and solder the joystick assembly. Remember, you must solder the parts after you slide the tube through the fuselage! Take care to get the two outside arms even. Route the pushrods for the throttle and rudder. Connect the elevator pushrod to the joystick. Mount the control horns to the front wing and install the wing. Hook up the pushrods from the joystick to the wing and try the controls. Remember, we don't want the wing to go too far up, but a little more down movement relative to the trailing edge won't hurt. By drilling a hole in your servo control wheel as shown in the sketch more "up" than "down" is assured.

### COVERING

I used a plastic film. Whatever you use, remember to keep the tail light. The real airplane was silver overall with black markings.

### ASSEMBLY

Put a drop of Hot Stuff in each wing mounting hole before you install the wings for the last time. I used a living hinge for the rudder on my Flea and Hot

Stuffed it in place. Make up a cockpit cover from 1/32 plywood. Mount a two inch scale pilot to it and hold the cover in place with wood screws. Bolt the engine in place, hook up the rudder, and your Flea is ready to fly!

#### FLYING

First, get the center of gravity correct! Most of the problems with this concept take place when people attempt to fly with an *aft C.G.*, **DON'T TRY IT!!!** With the front wing incidence set as the plan indicates, and the C.G. correct, we must now work towards getting the engine to idle really well. If you don't, you will miss half the fun of flying your Flea.

All that remains is to run the thing around the ground until you get up the nerve to let it fly. Once you do, you will find it does indeed fly very well. You might have to add some down thrust if your Flea pitches up when you apply power. If your Flea balances correctly, but refuses to leave the ground, you have too much negative incidence in the front wing. If it leaps into the air and stops, you have too much positive incidence. Don't worry about stalls, just turn out of them. You will soon find out that slow flight is about the *slowest* flight you have ever seen!

You can now enjoy flying the most misunderstood flying machine in history! Take heed, you might find "Flea Flight" as addictive as I did. To tell you the truth, I'm now building a slightly larger Flying Flea. Would you believe FULL-SIZE? Ah, but that's another story!

#### Soaring . . . . . Continued from page 30

You can get a Leisure motor at your hobby shop or directly from Leisure. The Graupner folder is available through Wilshire Model Center. Both addresses are in the appropriate ads in this issue.

#### Q & A FORUM

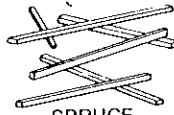
Robert F. Hilton writes from Shelby, North Carolina:

*"I am, you might say, an old timer in this model building hobby of ours (40 years, plus), but it has been an on-again, off-again type of thing for me. I have gotten really turned on with the two-meter class sailplane. . .*

*... I have only launched a sailplane from a hi-start, or actually an Up-Start (Craft-Air), but the project I would like to do is build a small winch launch system. Bill, I have never even seen a winch except in pictures, but I think a small one for two-meters only would be great.*

*"Here is what I would like to do. I would really appreciate your comments and answers. The winch motor would be of the type used to start 10 and 11 horsepower riding lawnmowers. I understand these are high torque starters. They are 12-volt, and would use a good, high-amp motorcycle battery. Do you think it would work? What size reel should I use? What size and strength line should be used? What length line should be used? How far away from the winch should the line guide or ring be placed?*

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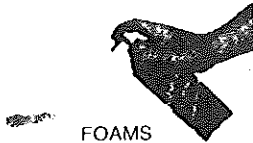


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Where can winch line be purchased?

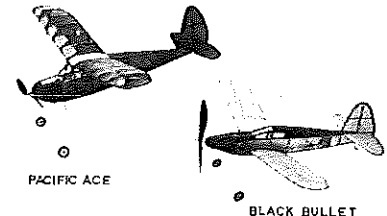
"Anything else that you think might be of help to us amateurs would be appreciated. Thank you, Bill."

Let me begin to answer you, Robert, by saying that I do not consider myself to be an "expert" on winch design. I've seen a lot of winches in my eight years of flying R/C gliders, but by no means have I seen them all, nor have I seen all combinations of motors and batteries used in this application. In this case, I've never even seen the type of motor you've described. If its purpose is to start small four-stroke lawnmower engines, I can't imagine that it will be sufficient for your needs . . . unless all you fly is lightweight "floater-type" gliders. The problem may not just be the lack of torque, but also in the lack of line speed (or horsepower). It's one thing to be able to turn over a 10 or 11 hp lawnmower engine at 60 rpm (I'm only guessing at the cranking speed here), but it is quite another thing to get the same motor to handle (let's say) half the torque at four times the speed (or more). When combined with a small 12-volt battery as you describe, the voltage drop from the load you will be placing on it will probably further weaken the system. It could very well work, but not for all two-meters in all conditions is my bet.

If I were you, I would get a long-shaft Ford starter motor (part number 3110 at your local auto parts store), and a six-volt car or marine battery of 50 amp-hours capacity or more. This will give you the basis for a winch that will be able to launch not only your two-meter sailplanes, but any other plane you may design or buy in the future. This motor/battery combination, in conjunction with a drum of about four inches in hub diameter and four inches in flange separation, will give you a winch that will launch your floaters safely, yet firmly

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and controllably. Remember, you can always pulse the winch pedal if you think the winch is pulling too hard, but you can't get more power out of a winch that's already giving you its all!

If your reason for wanting a "small" winch is one of physical limitations, then you are going to have to go this route or buy a winch such as the Fab-Tek winch which is small and fairly light. The only alternative you have is to build a "normal-size" winch like I described above and make a cart with wheels for it. At most, the winch motor and frame will weigh 40 pounds. The battery will weigh between 40 and 60 pounds depending on its capacity. (My 12-volt, 92-amp-hour, deep cycle marine battery weighs 54 pounds.)

If you are in the market for a ready-to-fly winch, the Davey Systems Corporation Winch is a good one. It's called the Pow'rto. I refer you to my review of this product in last month's *Model Builder* for further info.

As for the remaining questions . . . I would say that you probably need 1500 feet of line at most. This amount should