RCM's Chief Sunday Flier with his popular Peanut Scale SE-5 for RC. Leave it alone if you're a beginner!

FULL SIZE PLANS FOR KEN WILLARD'S

PEANUT SCALE SE-5

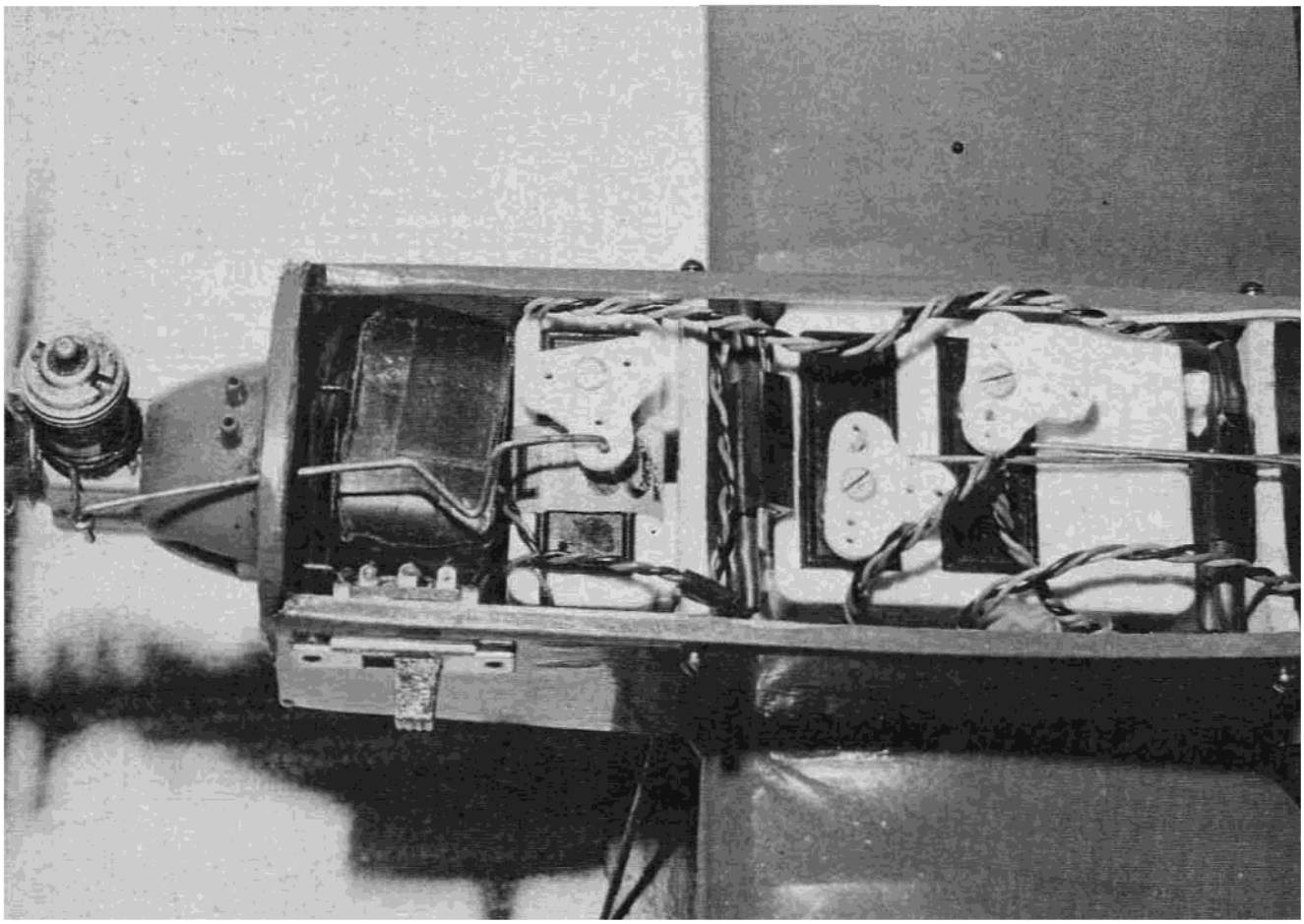
OK, fellows. We got the message. Last November we published some photos and a brief description of a Peanut Scale Se-5. At the time, it had been demonstrated at the Pioneers's Biplane Bash, and shortly thereafter it was flown at the WW I Jamboree at Hill Country Air Museum.

Because it really is a special purpose design, I didn't know whether enough of you would want to have plans, so I asked you to write if you wanted them. From the mail I received, it is evident that you'd like to try it too. So here are the plans and some hints on building and flying it. I can summarize very quickly, it's a helluva lot easier to build than it is to trim out and fly, but once it is trimmed out, it will amaze you with its stability, even though the response rate to the controls is very rapid under power, and has to be if you want any control at all when the engine quits. More about that later. Right now, let's get on with the building hints and kinks.

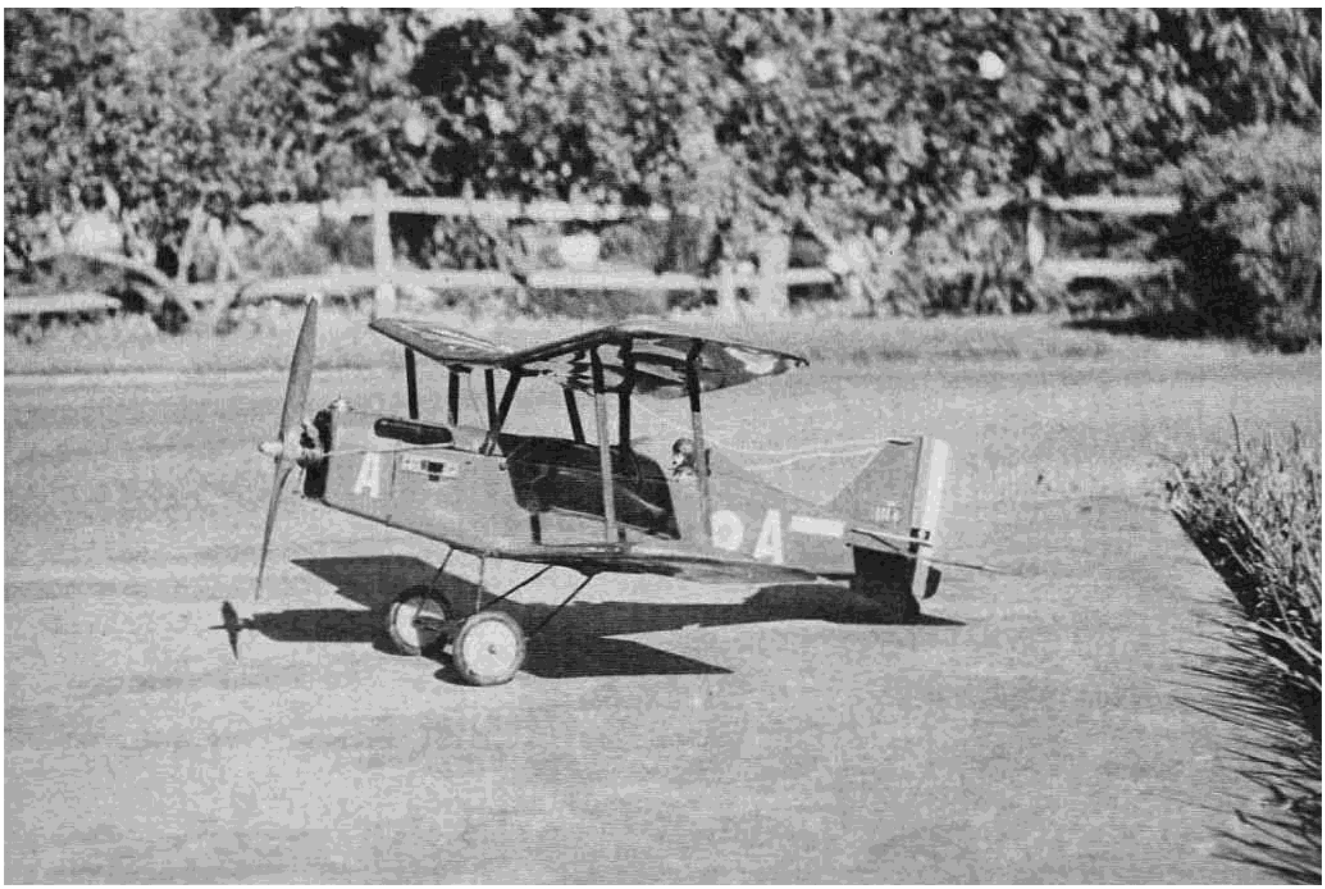
FUSELAGE

No problem. Two flat sides, a firewall, two formers, a tail post, with some 1/16" square longerons. The formers, or bulkheads if you prefer, are spaced so that the Cannon Super-Mini Block just fits in-between them, and there's room up forward for a Super-Mini servo, the switch, and a 100ma battery pack, which must be removed from the case and taped together because of the cramped space. Add to this basic structure a turtledeck and headrest aft of the cockpit (but don't Zap it in place before you've got the radio gear and pushrods aligned), and a removable hatch from the cockpit forward to the firewall, to which the cabane structure and the upper wing are permanently attached, and there's your fuselage. Add a cowl, carved from soft balsa, and the decorative cylinder head covers, and there you have it. Once you get the parts cut out and ready to assemble, a quick Zap job — with some microballoons at the corners of the firewall and sides for added strength, holds the whole thing together. The plans show wood sizes and placement. Please, if you're a beginner, don't write and tell me I didn't give enough detail. I know that, I also know that this plane is not for beginners — sometimes I wonder if it's really for experts — but I do know it's fun.

Note that the hatch has to be hollowed out to accommodate the servo arms — and tailoring the pushrods is also a chore. Since the forces are very light, I straightened out some small paper clips — they bend easily, but are strong enough for this purpose once they have been shaped. If you do this, you'll have to solder a couple together to have a piece long enough for each pushrod. When you've got them all lined up with the control surfaces — and some bends are needed — then you can Zap the turtledeck in place permanently.



ABOVE: Now that's what's called putting the world's smallest radio in a really small aircraft! BELOW: Ken's Peanut Scale SE-5 ready for flight.



TAIL SURFACES

These are cut from 1/16" sheet balsa stock. To tell you the truth, I'm not sure that the lightening holes are really needed, the weight saving is virtually zilch, but I did it more for the psychological effect than anything else. They just *look* lighter, and I was concerned about weight.

The stab fits in a slot which you cut in the fuselage after it's all completed. Just make sure that the slot is uniform on both sides so the stab is properly lined up with the wings.

The fin is butt joined to the turtledeck, and the sub-fin similarly to the bottom of the fuselage. The whole process, with Zap, takes about a half a minute.

WINGS

These are about s simple as you can get. Since the air loads are small, no spars are required; the leading edge and trailing edge gives all the bending strength needed. To get the dihedral break in the upper wing, just crack the leading edge and trailing edge at the rib location, prop the wing tips up the indicated 1/2" as shown, and then either use Zap and a few microballoons to fill the gap in the crack, or 5-minute epoxy. The center section cut-out in the top wing is achieved by the shaped piece of 1/8" balsa while the tips are pieces of 1/16" sheet balsa inserted between the ends of the leading and trailing edges. The ribs are cut from 3/32" sheet to give a little better adhering surface on the undercambered surface when the covering is applied.

The root of the lower wings butts right up against the side of the fuselage. The root rib is made from 1/4" stock to give added strength, and if you carefully tailor the edge of the rib to fit snugly against the side of the fuselage at the proper dihedral angle, and affix it firmly using 5-minute epoxy, the wing will have plenty of strength to take the air loads. Of course, you don't attach the wing until after it has been covered, as well as the fuselage, so when you're ready to attach it, hold it against the fuselage side, trace around the rib contour, and cut away the fuselage covering so that the joint will be wood to wood. This, of course, assumes the use of MonoKote. If you use dope, just join and glue in place.

CABANE STRUCTURE

This is a bit of a job in wire bending, and requires some care to get the right alignment. The best way is to bend the curved section which is epoxied to the top of the hatch, and be sure it fits the hatch curve, then the struts, and the attachment ends which are epoxied to the rear of the leading edge and the forward edge of the trailing edge. Once you get the bends fairly well aligned, epoxy the wires to the hatch, lay the wing upside down and attach the cabane wires and hatch to the wing. Again, this has to be done *after* the wing is covered, so little slits have to be cut in the covering to provide direct attachment to the wood. The epoxy will keep the slits closed after the assembly is dry.

LANDING GEAR

Another somewhat tedious wire bending job. However, .047 wire isn't too hard to handle. The axle is soldered to the landing gear wire, and this has to be a good joint — it takes a beating. I wrapped mine with a small length of fine copper wire, finally, after breaking it loose a few times.

Fairings, both for the cabane wires and the landing gear, can be made simply by cutting lengths of 1/16" by 1/8" balsa, sanding, then Zapping them to the wire and painting. They're great for appearance, but do keep coming off on rough landings — which are the rule rather than the exception.

INTERPLANE STRUTS

These are optional, and mainly for appearance. Cut them from 3/32" wood, shape, and then insert a short length of pin right in the end, with the point sticking out. Stick the end of the pins in the ribs, (the end of the pin should only stick out of the strut about 1/8") first on one side, then bring the wings together on the other side with the struts in place. Then when you pull the hatch down snugly on the fuselage with the rubber bands, the pressure of the wings holds the struts in place. Here again, if you plan to fly a lot, it's better to fly with the struts removed, otherwise they tend to tear holes in the covering during hard landings.

COVERING

Top Flite has an olive drab MonoKote that looks fairly authentic. True, it is darker than the green color which the RFC (Royal Flying Corps) used, but your're not really going for scale points anyway. And, the MonoKote can be ironed right to the ribs to maintain the undercamber, and that's important.

RADIO INSTALLATION

The plans show the Cannon Super-Mini brick plus one Super-Mini servo added for motor control. However, the .010 motor control is not readily available, so you can use the 100ma battery pack as it comes from the manufacturer, if you omit the third servo. Threading the pushrods from the brick to back to the control surfaces requires a few bends, one of which is for adjustments. Note that no Kwik Links are shown; I just made the bends carefully, and then with slight changes was able to make any surface adjustments as required. Loads are light, and the wires won't flex, even though there are bends in them. And, since the loads are light, I also used clear MonoKote to make the hinges with.

FLYING

If I had a dime for each time I've written, "Find a nice field of tall grass for testing," I'd be a rich man. But I've gotta' say it again. This little Se-5 is very touchy, and just so you won't feel bad, I crashed mine about eight times before I got it trimmed. However, I found that field of tall grass (weeds, actually) so the crashes were not serious.

First off, use the hottest fuel you can get for the .010 because you'll need every ounce of thrust. The model only weighs about seven ounces, but the wing loading is very high, as is the power loading. Don't launch unless the engine is turning up at full power. A little headwind is also a help.

Rudder throw should be kept to about 3/32" at the most. That means the innermost hole at the servo, and the outermost hole on the control horn. Even so, be gentle on the stick.

Launch the model straight ahead and level — not up. Hold it by the landing gear, and watch out for the sub-fin hitting your hand on release, or that's the end of that flight before it gets started.

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