

## TAILLESS FOR RC-HLG

Those who have seen the Proceedings of the M.A.R.C.S. National Sailplane Symposiums recognize the wealth of information contained therein. We have read our copies several times, but it seems each reading finds us discovering some new piece of information we have apparently missed previously. Too, we are often given to assembling facts and ideas from several of the Proceedings and coming up with a synthesis which we then are able to put to use in some way.

The Proceedings for 1983 and 1984 included some good information on Hand Launch Sailplanes (Class A). We had been thinking about building a Hand Launch Sailplane without a conventional tail assembly because of our intrigue with tailless aircraft, but it occurred to us while reading the Proceedings that each of the difficulties and/or problems outlined could be solved by going to a tailless design. Here are some of the major points:

(1) The performance of an RC Hand Launch Sailplane seems to be inversely related to its wing loading, i.e.; the lower the wing loading, the better the performance. In constructing our HL, we used a full D tube of 1/16" balsa and 1/8" spruce spars. Ready to fly, it weighs 16 oz. But the wing loading, 3.5 oz./ft<sup>2</sup>, is actually below the FAI minimum of 3.95 oz./ft<sup>2</sup>, so making the structure any lighter is really quite pointless. She is very strong structurally and has cartwheeled countless times with no damage. We finally broke the fin by running into a cyclone fence. Our experience points to the ease with which a low wing loading can be obtained.

(2) Keeping the Reynolds number above 60,000 is very important. Going below that magic number makes it very difficult to control airflow over the upper surface of the wing, and small gusts can stall a wing easily. A low Reynolds number also makes pilot control a critical factor. Our RC-HLG has a tip chord of over 9 inches and flies faster than a conventional design, so its Reynolds number is always well above the minimum value.

(3) A conventional RC-HLG with a constant chord or tapered chord wing is very sensitive to CG placement - even 1/16" may make a difference - and a lot of trimming seems to be the rule. On our 'wing it was very easy to find the correct CG: we used a rough approximation at first and then added and subtracted weight until she flew well with the elevons trailing smoothly with the rest of the wing. No worries of looping on launch because of wrong incidence angle, either.

(4) Thermals that are low to the ground tend to be very small, so a tight turning radius is necessary to take advantage of them. Our tailless RC-HLG turns very tightly.

