

## SUGGESTIONS FOR FIRST 'WINGS - PART I

We've been writing this column for over two years now, and have received an immense amount of mail. Each and every letter received has been answered, and we've enjoyed the whole process tremendously. Many ideas for this column have been derived from readers' questions, and we wish to thank everyone for their positive comments and ideas. Your interest and enthusiasm is very much appreciated.

While many readers have written asking for airfoil data, computer programs, and current sources of flying wing information (hopefully in English rather than German), the most frequent request is for our suggestions regarding a first tailless sailplane.

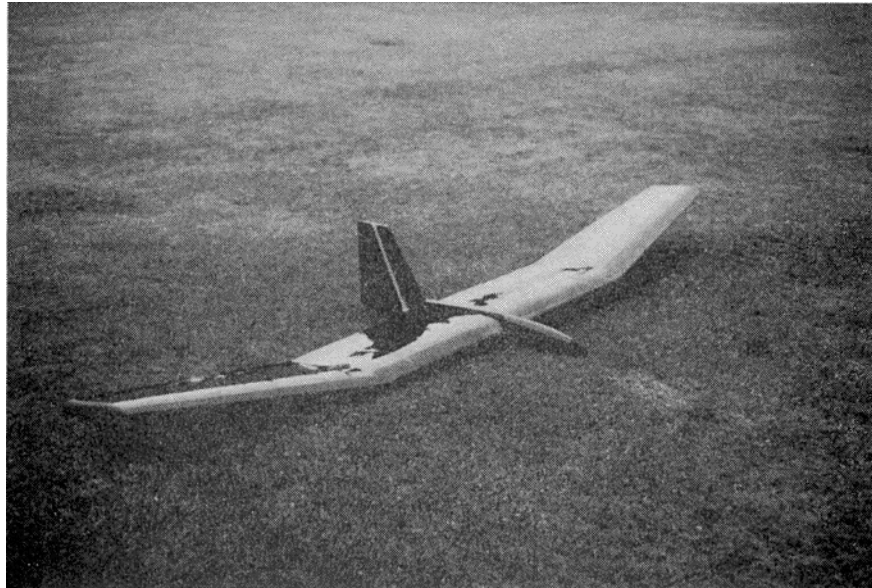
Those who want to try a tailless sailplane have various motives. Some want a glider which is easily built, fun to fly, and a bit different than what's normally seen at the flying field. Others want to start construction of a flock of 'wings for competition because they believe this is the best method of achieving a particular set of goals. One fellow wrote and said his intention was to go through the whole League of Silent Flight program using only tailless designs! Since the majority have built kits and feel confident a scratch built 'wing will not pose a difficulty, we normally suggest one of two gliders which are available as full sized plans. The main determining factor in making our recommendation is the experience of the builder. If the individual has been building, flying, and enjoying rudder and elevator type gliders, then we suggest Dave Jones' Raven. If the writer has experience with aileron sailplanes, then we recommend Dave's Blackbird 2M. This month we'll discuss the Raven; a description of the Blackbird 2M will follow next month.

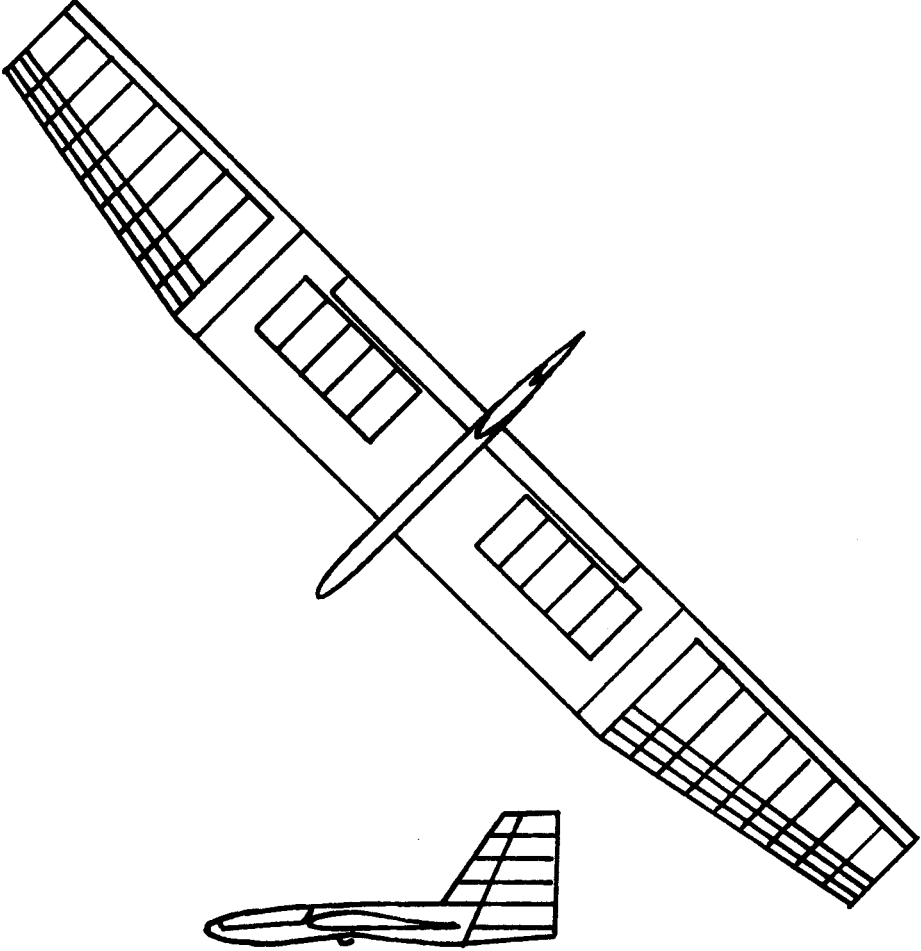
The Raven is a plank design which comes in several versions. There's a Mini-Raven of 78" span at the smaller end of the scale, and a Raven-Super with a 124" span at the larger end. Our choice is the Raven version

published in Model Builder magazine some years ago. It has a span of 110" and a very nice streamlined fuselage. The Model Builder Raven fuselage provides a snug fit for a 500mah battery pack, receiver, and the two standard size servos. Control is by rudder and central elevator. The wing is in three sections, with the center section being permanently attached to the fuselage. This means the two servos in the fuselage can always remain connected to their respective control surfaces. The outer wing panels include the dihedral breaks and are of very light construction so turns are not inhibited by unnecessary inertia. Construction is of balsa, plywood, and spruce; there are no exotic materials used. Neither of the two Ravens that we've built have required significant nose weight to achieve the proper CG location. The plans show an easy ballast tube installation.

We built our two Ravens by following the plans and directions exactly. Although neither has flaps, we recommend the necessary modifications. Use of flaps will allow higher launches and lower landing speeds. Due to the size of the fuselage, the flap servo will most likely need to go in the wing center section. As mentioned above, the center section is permanently attached to the fuselage, so there will be no need to disconnect any of the flap mechanism when disassembling the Raven after a flying session. The flaps themselves should be about 5% of the total wing area, be mounted on the lower surface of the wing with their leading edge at 40% of the local chord, and be capable of 40 degree deflection. Flaps should not be used while thermalling, as to do so markedly reduces performance.

The Raven is a very stable sailplane which we've found will automatically center in a thermal. A few years ago, at a Northwest Soaring Society Tournament in Richland, we launched, flew out, and thermalled for over five minutes while moving the controls only enough to make sure the radio gear was still working. Later we realized our options would have been severely limited had the radio gear not been working, and the flight would have perhaps been even better had we gone ahead and let her fly without any control input at





all until it was necessary to bring her down to land.

Last year we found the above described realization to be more than completely accurate when, during a winch launch, the receiver battery pack shorted out. The Raven went up on tow without a waver, floated off, went into a nice gentle left turn, and did a picture perfect landing directly next to the winch several minutes later. That experience served to confirm our belief that the Raven makes a great trainer. The performance certainly awed the spectators!

Our first Raven, affectionately called Lenore, is covered with black Monokote on the top and metallic charcoal on the bottom. Our second, Encore, built a short time later, is all white Monokote. Both have a chrome band around the right wing outboard of the dihedral break. We learned to fly proportional with Lenore, and both have had their share of collisions with soccer goal posts and landings in trees. But after more than six years they retain the majority of their original covering, and structural repairs have always been easily accomplished.

If we were to build another Raven, we would again choose the Model Builder version. We'd add flaps and use the CJ-25<sup>2</sup>09 section rather than the CJ-3309 shown on the plans. The CJ-25<sup>2</sup>09, the newer section of the two, has a bit better penetration capability with no noticeable loss of lift. Since both have large flat areas on their bottom surface, there is no change in construction method or completion time.