



Willie Richards poses with MonoKote covered prototype of 'Gus'. One of the best light-air machines we have flown at RCM.

GUS

By WILLIE RICHARDS

This thoroughly tested glider is the answer for light air and zero sink conditions. A magnificent performer. It is as easy to fly as it is to build.

There is a condition which is not very common among model sailplanes that is called zero sink. This condition is often overlooked by most slope soarers and very few designers & flyers enjoy it's benefits. This is when lift is equal to the pull of gravity either in thermal or almost nil wind conditions on a slope.

Dr. Rolph McPherson, noted designer and glider flyer, once stated that these conditions provided the best time to soar. GUS was designed to need 10 to 20 knots of wind blow-

ing on a slope for adequate lift. Several visits to our local site showed that I needed a sailplane that would fly as well in weak as in strong lift.

Subsequently, I began working on a wing loading and airfoil combination, that, along with scale appearance, would give a clean design. Gus would have very good penetration ability without the loss of performance. Several wings were used employing different airfoils: flat bottoms, symmetrical and undercambered. The undercamber proved

to be the better airfoil for my purpose of having good lift at low speed — even down to about two mph of wind on the hill. There were even times when flying the GUS that we thought we were breaking the sacred laws of nature. We saw many fine high performance sailplanes setting on the ground while we enjoyed this condition which is known as zero sink. All things had to work and carry their own in the final design — even the fuselage is aerodynamically de-
(continued on page 76)

(continued from page 28)

signed to carry some of its weight. In some comparison flights the performance is along with that of the famous Little-T, Barnacle, and Malibu. These are some of the standard class sailplanes which have fine performance even down to winds below 5 mph when the weight is kept below 32 ounces. The weight of the GUS was a flat 21 ozs. ready to fly!

Along with scale-like appearance we wanted our ship to look, as much as possible, like the real sailplanes. Several modifications have been made from the original GUS to bring its appearance to these standards. With cockpit details, such as, instrument panel, pilot and clear plastic canopy GUS becomes a real sharp looking sailplane.

This model was designed as a thermal as well as a slope soarer to meet the standard class sailplane requirements. We hope that this will some day become a class where such sailplanes, as mentioned in this article, and many others that are under the 100 in. mark, may compete against each other in local and open competition.

GUS has, also proven to be a fine sailplane in the hands of the absolute novice. This was my first sailplane, not only to design, but to have successfully flown. (It has taken 12 months of building & flying this design to give us our present version.) Gus has, also been flown rudder only . . . showing very little loss of performance without the aid of elevator. I have never flown it with any of the Galloping Ghost or pulse rudder systems but I am sure it is docile enough for them. For best performance, keep the weight under 25 ozs. ready to fly.

CONSTRUCTION

WING

The wing is simple and straight forward in construction. Cut out all ribs from medium hard quarter grain stock of 1/16 sheet balsa. The leading edge is medium hard balsa, with spruce spars and balsa trailing edge. The wing is jigged to get the true airfoil shape as

shown on plans. Use 1/2" square pieces of 1/32" sheet under the trailing edge of each rib; The forward portion of the trailing edge.

The wing is built in 4 panels. Dihedral is then put in giving the center section 1 1/2" under each panel. The tip panels will have 4" Dihedral each. All gussets and bracings are added along with the top sheet planking and cap strips. Finally, add the wing tip blocks. When the wing is finished, sand to shape. We covered our first model with silk using 4 coats of 50-50 dope and thinner. Later versions have been covered with Super Mono-Kote. Use the covering of your choice.

FUSELAGE

The fuselage is a simple box-type for simple construction. Pick two evenly matched straight grain sheets of 3/32" balsa. Add all bracings, publers, and stringers to the fuselage sides. When making your box, make sure you have proper alignment. Add the hose blocks and sand to shape. The canopy is cut from a 10-12" commercial type turned in the reverse position. At this point, the floor should be sprayed black and all cockpit details added. Then canopy is cemented to the floor along with the rear canopy bulkhead. Hold down hooks on the canopy floor and the bottom of the fuselage should be installed. A switch can be eliminated by just lifting canopy to un-

plug the battery pack from the receiver in just a few seconds. The fuselage top and bottom planking is added and sanded to shape.

TAILFEATHERS

Rudder and stabilizer is cut from medium 1/8" sheet and sanded to shape. Use hinges of your choice. A piece of 1/8 dia. aluminum tubing is used to join the elevator halves.

ASSEMBLY

Add tailfeathers to fuselage checking for true alignment. A 3/16" square strip is beveled at the bottom of the fin on the stab. The entire model is to be sanded to a fine finish & then covered with your choice of material. But whatever you use, be careful to keep the weight down — **below 25 ozs.**

FLYING

Be sure that GUS balances at the point shown on the plan and there is no warps in the wing. If there is, be sure to carefully steam them out or twist with heat if Mono-Kote is used. I balanced my model by shifting the radio gear until the desired point had been reached. I have had some horrible experiences with power and sailplanes that had improper CG locations. **NOW FOR FLYING** — GUS is very docile and easy to fly. A gentle launch into the slightest breeze will get the ship airborne. Be sure to go out at least 20-30' from the hill before making your first turn. Your turns should be smooth and responsive on this little sailplane with a minimum of skid. The nose will drop slightly in those turns. From this point on, no one can really tell you how to fly **YOUR SAILPLANE. HAPPY SOARING TO YOU!** ●