THE SAILPLANE IN RESEARCH, TRAINING AND SPORT *(continued)*

versity, and thus the potential of the continental plains country for long distance soaring was demonstrated. But at the same time it became evident that we lacked the sailplane to take full advantage of the energy available from that hot, flat land. We needed a highspeed sailplane, since the thermals last only eight to ten hours, and in this time a record-breaking pilot would have to fly at least 500 miles.

In 1948 another young student, Dick Johnson, attending a symposium on the ultimate performance sailplane held at Elmira under the joint auspices of the Institute of the Aeronautical Sciences and the Soaring Society of America. During this symposium, the essentials for the design of a sailplane capable of long distance flights were laid down. With these essentials in mind, Johnson went back to California where he went into consultation with a skilled sailplane designer, Harland Ross, and subsequently retained him to build an ultimate performance sailplane. While this ship was in progress, Johnson decided to come to Mississippi State College to study aeronautical engineering. Here he was offered facilities to work on the sailplane himself and thus expedite its completion, which was going very slowly. While building his craft, he also studied much of the recent research in aerodynamics carried on at the Engineering Research Station. In spite of all this careful work, however, the sailplane demonstrated only a mediocre performance when first flown. By testing the sailplane in the free atmosphere, diagnosing its ills from the results, and correcting its faults, the performance of the craft was steadily improved, and by the summer of 1951 Johnson was able to bring the glide ratio of his sailplane to 38 to 1. In addition to this, because it had a laminar airfoil which had been made to behave laminarly, the ship had extraordinarily high speed performance. A carefully computed speed chart permitted the pilot to extract the utmost in cross-country speed from thermals with this sailplane.

Finally, on August 5, 1951, Johnson succeeded in recapturing from the Russians the coveted soaring distance record, which they had held for so many years. The flight symbolized a final triumph of free enterprise over government control: the young pilot had spent his own money for the preliminary construction of the ship; he

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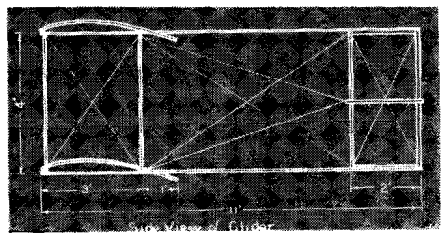
"GLIDER THAT SUPPORTED BOY BUILT BY AUBURN LAD"

Quoted from Auburn, Maine Newspaper of 1912



See cover for photograph of the glider, patterned after Wright Brother's 1901 model. Other ship on cover: Farrar Wing.

by CHARLES E. KERR, JR.

The old hang glider which I have in my possession and am now rebuilding, is shown in the drawing.

The previous owner, Mr. Harold Cooper was able to find an old clipping and part of the plan that he drew up from a picture in a magazine. The clipping *(not shown)* was published in the year 1912. The glider has been flown successfully, and, according to Mr. Cooper, for a distance of over 100 feet.

The construction of this glider is interesting because in those days the builders took all of their information from pictures in magazines. The spars are ¾" by 1¼" by 20' pine stock. Each wing has two of these spars. There are five cross pieces ¾" by 1¼" by 3', also of pine. These are between the two spars, and the spars are screwed down flush with the ends of the cross pieces, forming a 3' by 20' rectangle. In the bays of this rectangle there is music wire, which is used as cross bracing. In the middle of each bay there is a 3/16 carriage bolt to which the music wire is attached. These bolts form a turnbuckle to keep the wire taut. On top of and flush with the leading edge of the front spar the ribs are screwed on. A slight amount of pressure is applied on the end of the rib, forming camber, and the back of the rib is screwed on to the rear spar.

The top and bottom wings are exactly alike, except for the number of ribs — twenty for the bottom, and twenty-one for the top. One rib is left out of the middle of the bottom wing to make room for the pilot, who stands through the wing, using two of the cross braces for support.

The two booms going back to the tail assembly are ¾" by 1¼" by 11' pine stock, cross-braced with music wire and a carriage bolt turnbuckle.

The vertical stabilizer is a 2' by 4' rectangle, cross-braced with music wire. This stabilizer is slid between the top and bottom booms and bolted there. The horizontal stabilizer is 2' by 6', rectangular in shape. It passes through the vertical stabilizer, forming a cross between the two units. This whole tail unit is then guyed back to the main wing structure.

The wings are covered on the top of the ribs only, with linen. This is secured to the ribs with carpet tacks passing through stiff paper washers. The tail surfaces are covered on both sides with the same material and same type of tacks and washers.

The two wing structures are held apart by vertical struts, of which there are ten. These are ¾" by 1¼" by 4' pine stock, cross-braced with music wire and carriage bolt turnbuckles. The ends of these struts are bolted to the five main wing cross braces with 3/16 carriage bolts. The complete structure is not painted or doped in any way.

It is my plan to rebuild this hang glider for exhibition purposes only.

* * *

Just fifty years ago (1903) the Wright Brothers accomplished the first man carrying powered flight, after much practice in gliders and making the first sustained soaring flight in 1901. The distance was 120 feet, duration 12 seconds.

WESTERN TOW SHIPS *(continued)*

many that will make excellent tugs can be had in pretty good shape for around $600. If some of the club members are qualified to do their own work and bypass the $3.50 an hour that mechanics are getting these days, so much the better, and the club gets a good tug at a reasonable price.

Regardless of the plane used for towing, or how time is charged, you will seldom find tows available at less than a dollar per thousand feet. With rented ships, it may go as high as two dollars per thousand, plus ferry time. Western averages seem to come out at around a dollar and a half per thousand for flights to a nearby ridge or to soaring altitudes right over the field with no ferry time to worry about. No matter how you look at it, there is no such a thing as cheap flying when you have a powerplant up front.