A NEW TYPE OF SAIL PLANE

R. Platz

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16. Abstract

This is a report from a newspaper article on some early attempts to construct sail planes. The authors are examining some new designs and new concepts for the flight control of such craft. They note that the prospects for the construction of a light weight, durable, easily disassembled plane of this type are good.

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A NEW TYPE OF SAIL PLANE[1]

R. Platz

The great interest, which has been exhibited in the sport of sail planes, /1* has given rise to attempts to construct a sail plane that even in these times can be purchased by any and all lovers of the sport. The following are prerequisites for this:

1. Very low retail price; not appreciably more than the cost of a good bicycle.

2. Pieces that can be put together in a relatively small package so that it can be transported even in an automobile.

3. Durability of all points so that it will not be harmed when seized with force or when struck.

4. Quick and easy assembly.

5. All parts must be easily replaced or substituted.

6. The sail plane must be able to be carried by one man.

Until now these conditions had not been fulfilled, in the making of sail planes. We have here, then, a real advance.

The basic concept was inspired by the memory of a sail on a sailboat rigged up as a sloop; by proper adjustment of the sails and proper agreement of the center of gravity of the sail with the lateral center of gravity, one can sail for a long time without steering: the sails are "stable". A boat positioned in this manner can be guided to a limited extent by hauling in or letting loose the jib.

Let us now take two such sails and place their surfaces along side one another. We shall view the lateral center of gravity as the critical. We shall

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[1]This study had already gone to the editorial staff on February 16, 1973, at the wish of the author, it is now being made available to the public for the first time.
*Numbers in the margin indicate pagination in the foreign text.

turn 90° about the longitudinal axis. From this, as one can see from Figure 1, we have a sail plane with which we can fly straight ahead and can adjust for ascent or descent. In keeping with the intended simplicity and low purchase price, we should seek to avoid any other steering and further mechanisms. We need to test to see if what we have already proposed provides sufficient steering as it is. Transverse stability could be achieved through the proper V-positioning of the crossbeams, or masts. Then, the only thing missing is the side-rudder. The jibs can assume this function.

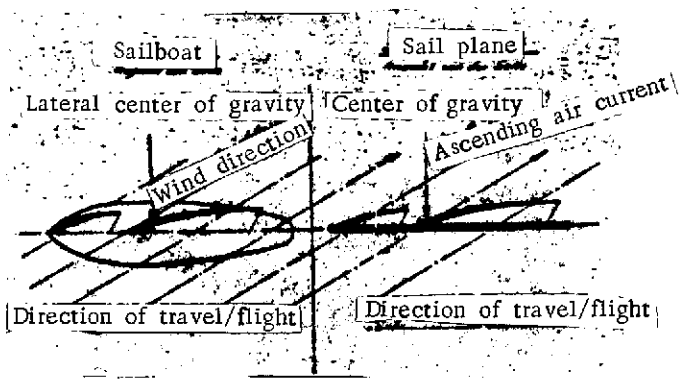

Figure 1.

A paper model, as Figure 2 shows, served as the first model. It is weighed down with a paper clip. The transverse stability, because of the V-positioning, is good. The rudders for ascent and descent work fine. Completely adequate steering toward the right side was achieved by activating the right jib. This was the case at all wind speeds and even when we let the paper model fall perpendicularly. By activating the left jib, the same results were attained on that side.

Now the final form was decided on and in four hours of work a model 1.3 meters wide and 0.4 square meters in surface was fabricated. The first trial flights took place in dunes of about 6 to 8 meters in height at the beginning of November, 1922. The lack of wind on the first day made it unsuitable for flying. The precise positioning of the jib and of the weight, since it consisted of a vice, whose position could be varied, could be worked out that much the better. On the following day, the first success was achieved. The "model" "sailed" in a light wind with a surface weight of 2 1/2 kilograms per square meter. /2 Repeatedly, it was able to ascend. Headed into the wind, it moved along the ridge of the dune without loss of elevation, just as this has so often been observed and described of seagulls. From this model it was now to apparent that all the conditions previously mentioned could be met. A large-scale plane could present difficulties only with non-rigid wings or a (the wings') changeable profile.

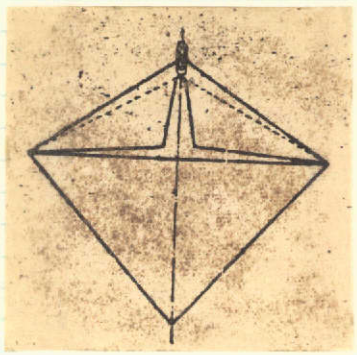

Figure 2.

To study this question, which was now of primary importance, another model was built in a few hours. It had a span of 2.5 meters and a surface of 1.3 square meters. In test runs, it exhibited no appreciable variation from the performance of the smaller model.

On the basis of these findings, a sail plane of about 16 square meters surface was constructed in a few days.

It consists of a curved skid made of steel pipe. The rear mast of wood is inserted into its back end. This mast has a soldered joint on either side for the insertion of the masts, which likewise are of wood. The other main parts are the "main sail," which is sewed together, and the jibs, their necessary mountings, and three tin fittings.

The "rotary parts" consist of but a single screw, which holds the jibs together, jibs that can be turned forward.

In ten minutes the whole plane can be tied up, ready for carrying. It has the following dimensions: 3.3 x 0.35 x 0.25 meters and weighs about 40 kilograms. A means of transporting it may be seen in Figure 3.

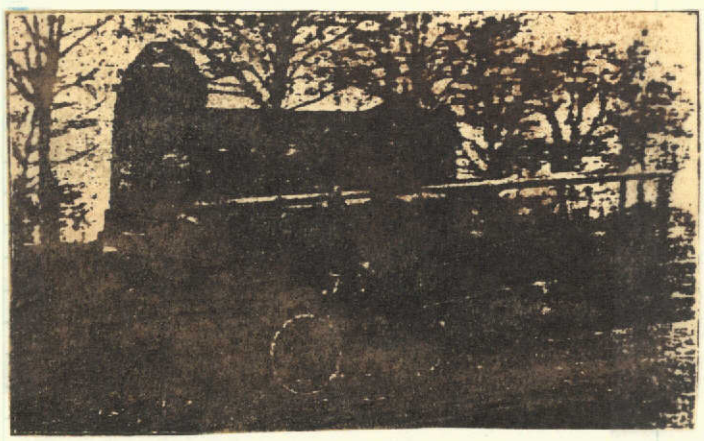

Figure 3.

One man can put the plane together for sailing in fifteen minutes.

As with the smaller models, tests were usually run in a mild wind and with a small weight. Flexing of the sails, steering, and landing worked well, just as with the models.

Further tests in the following days were undertaken in strong winds. A sand ballast

of up to 75 kilograms was used on dunes 25 meters high. About fifty test flights were undertaken without a pilot and with the rudder fixed. Often the sail plane landed in the sea or behind the dunes without the slightest damage.

The next tests were carried out with pilots. The plane was held by four ropes and began with a pilot weighing 55 kilograms. Ten more pilots, weighing up to 100 kilograms, established that the rudder for ascending is easy to operate. Because the cliffs of the dunces were, in places, vertical, it was too dangerous to cut the plane losse without further practice.

The first free flight took place on the next flying day in February, 1923, in a mild wind and from a 10 to 12 meter high dune.

Now tacking must be tried in the dunes, which really are not suited to this, and the testing may be considered concluded.

Even though the aerodynamic qualities of this sail plane are not the same as those of a well-rigged sail plane, still, the advantages noted at the beginning are of great significance.

It will be interesting to hear the views and opinions of experts and of practitioners of plane sailing concerning the problem we have described and this first attempt at a solution.

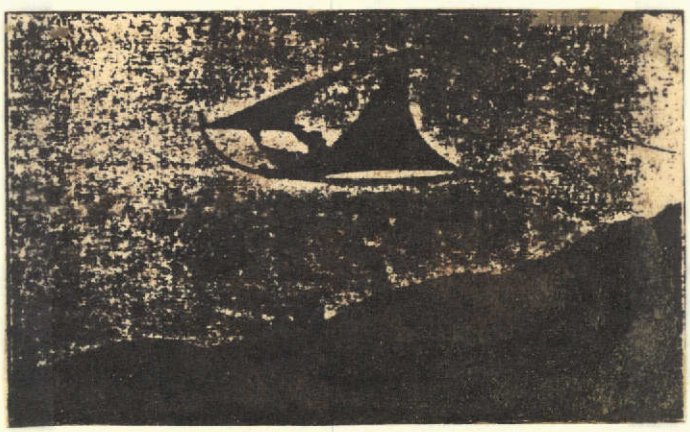

Figure 4.

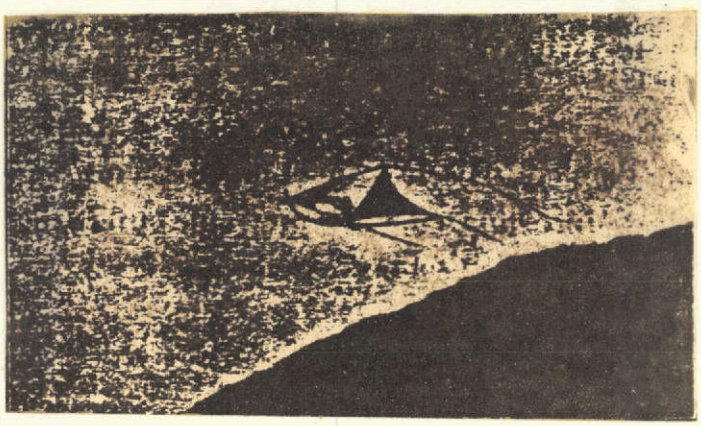

Figure 5.

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