

The HABICHT AEROBATIC SAILPLANE

Text and photographs by German Research Institute for Sailplanes at Darmstadt



The "Habicht" was developed by the D.F.S. as an extremely strong ship for unrestricted aerobatics, yet was not made so heavy that high performance soaring could not still be done with it. For this reason, the "Habicht" may be used for stunting as well as high performance soaring. It is not specialized for any one category of soaring, that is, its use is practically unlimited. As far as actual soaring is concerned, the "Habicht" corresponds approximately to the Rhoenbussard although the gliding angle of the "Habicht" seems to be better than that of the Rhoenbussard. At the present time, measurements of flight characteristics of the "Habicht" are being carried out. The general features of the glider may be seen from the illustrations. It has a mid-wing which is more advantageous than the high-wing, especially as far as strength is concerned. A shoulder-wing type was not chosen for reasons of good visibility and aerodynamics. The connection between wing and fuselage is similar to that of the Rhoensperber.

The "Habicht" has a taper-wing with a 45 foot span. The gull is rather short, as too much lateral stability was to be avoided. The lower edge of the outer wing is horizontal so that the wing has a slight V shape, when considering flying upside down. The choice of the wing section resulted in the following requirements: sufficiently large lift coefficients and small moment coefficients for normal flight combined with good lift and drag conditions in inverted flight.

No airfoil can furnish maxima for all these requirements, and none of the present wing sections was satisfactory in every respect. Therefore, the sections Goettingen No. 420 and No. 693 were combined into one section. The outer wing has section No. G-676. The basic section of the wing has a thickness of 14%, curvature of 3.8%, and a cmo of 0.078.

The aileron is statically and aerodynamically balanced, so that the aileron forces are small even at high velocities, and the danger of aileron vibration is reduced to a minimum. Figure 1 shows that deflection upward opens a small slot, while deflection downward leaves no slot. This design is chosen to obtain positive moments of course. In this way, considerably higher drag results from the aileron deflected upward compared to the aileron deflected downward.

The wing is a monospar with leading edge taking torsional stresses. All torsion moments of the wing are carried into the fuselage by a reinforced rib. The conventional shoulder piece was not used on account of its complicated design (diagonals and so on), which is very difficult to stress analyze. The simple design of one rib as a torsional member makes possible easy calculation and lowest weight. One diagonal and the plywood covering only are used to take care of the frontal drag.

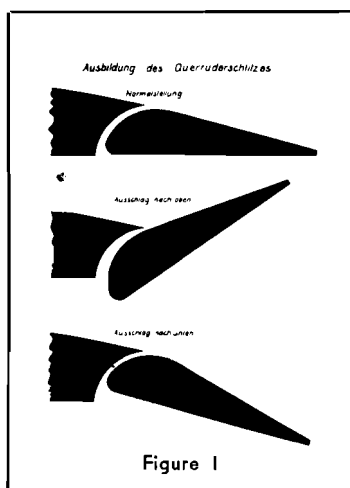


Figure 1

Translation by Dr. Karl O. Lange

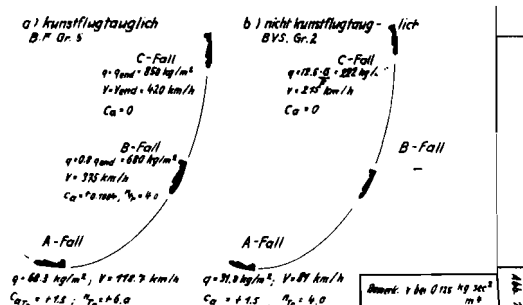


Figure 2

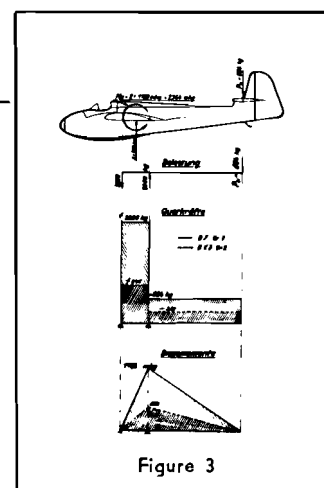


Figure 3