

ABSTRACT*)

Effect of Stabilizer Lift on Sailplane Performance

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Since the sailplane represents a highly optimized aerodynamic form, the influence on performance of small effects such as stabilizer lift is worth considering. This paper analyzes the induced drag of the stabilizer and its effect on sinking speed. An equation is derived relating the fractional increase in sinking speed to the stabilizer lift coefficient and the aircraft's shape parameters. The equation for aircraft pitching moment in steady flight is introduced in order to obtain the relation between fractional increases in sinking speed and airspeed and center of gravity location. Data from a Schleicher K-8B is used to illustrate the resulting formula. It is concluded that non-zero stabilizer lift increases sinking speed and for a K-8B the greatest effect is with a forward C.G. position and a high airspeed.

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A UNIVERSAL TABLE FOR GLIDING

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INTRODUCTION

Some non-technical pilots or beginners are usually confused when faced with the problem of making a speed ring or computing final glide angles and speeds. Things become worse when the only known performance data are the best glide angle and corresponding speed.

The "universal" table was made for these people and gliders, but even highly technical people may find it useful when transforming a shower of test flight points into a polar or in analyzing non-quadratic drag characteristics caused by flaps, deep laminar bucket airfoil, flow separation, etc.

USE OF THE TABLE

For any particular glider, construct a similar table using the following steps:

1. Get (or choose) the values for the best gliding angle (L/D) and the corresponding speed (V^*) from literature maker's data or flight measurements. Compute the sinking speed at best glide speed

$$v^*(\text{m/s}) = \frac{V^* (\text{km/h})}{3.6 \cdot L/D} \quad \text{or}$$

$$v^*(\text{ft/min}) = \frac{87.93 \cdot V^*(\text{mph})}{L/D}$$

2. Multiply columns 1, 3, 4, and 6 by this value of v^* .
3. Multiply columns 2 and 7 by the best glide speed V^* .
4. Multiply column 5 by the best gliding angle G.