

THE FLETTNER FLAP

One of the side effects of reflexed airfoils is a substantial down force on any control surface mounted near the trailing edge of the wing. This is caused by the reflex itself, and is indicative of the download which makes the airfoil dynamically stable once the CG is properly located.

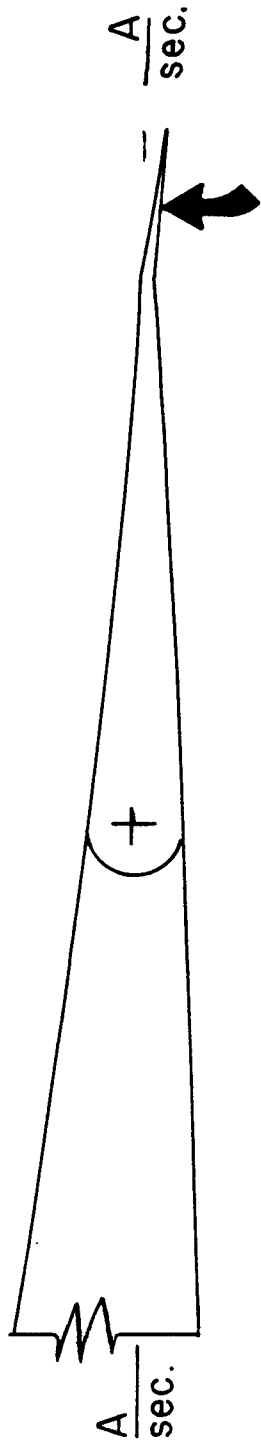
At high speed, this force can easily overpower a servo, thus reducing the reflex. With less down force at the trailing edge of the wing, the sailplane pitches forward and steepens its glide angle. A vicious cycle then ensues, with greater speed, even larger loads on the servo, greater reduction in the reflex, and an ever steeper plummet to the earth. If the pilot realizes what's happening, remains calm, and has the intestinal fortitude to push forward on the elevator stick, an outside loop may be possible before contact with the ground occurs.

We first heard about the Flettner flap through The White Sheet "Flying Wings Special," Sean Walbank, Editor, where it was seen on Dieter Paff's PN9f design. Dieter had lost three models due to overloaded elevator servo prior to incorporating it into the design. We have since seen its use on several tailless designs, both full size and model.

The Flettner flap is a simple mechanical device which reduces the down load on the control surface by acting as an aerodynamic balance. The size of the Flettner flap should be directly related to the size of the control surface; see the diagram on the next page.

As you can see, the flap is not large. Its effect on overall drag is probably negligible. An additional bonus - it can usually be installed as a retrofit on an existing design.

Whether or not you install a Flettner flap on your design, remember to always arrange elevator servos and control linkages to PULL for UP!



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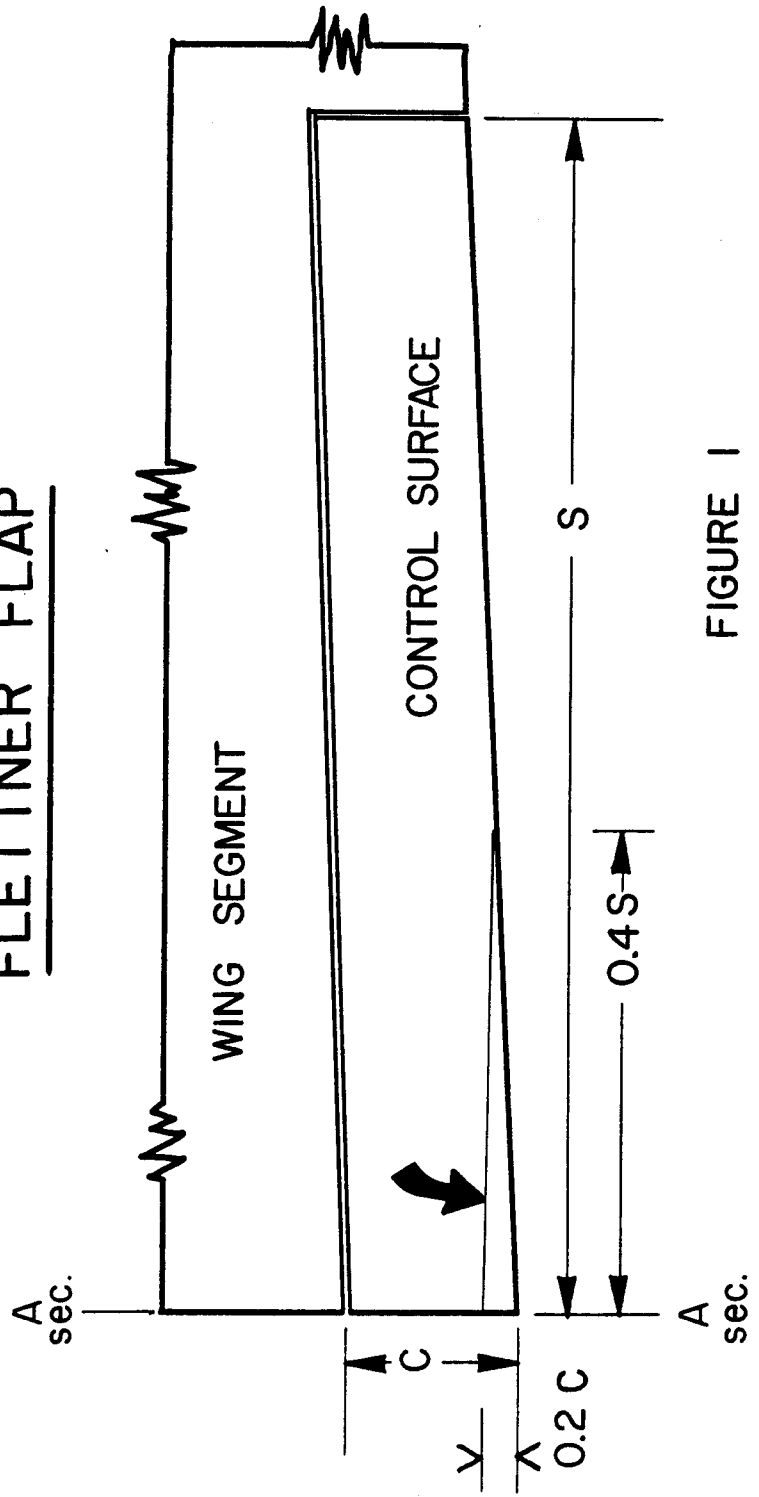


FIGURE I