

expectations. My reason for fairing it differently was to compensate for my error in setting Adastra's wing incidence too low.

As a result of discussions with Dr. Eppler on the airfoil subject, it was decided that the airfoil should be refaired aft of the .7c line. Therefore, the wing structure aft of the .7c line was removed, out to but not including the ailerons. Figure 1 shows the original Eppler 146 airfoil section used and also as it was subsequently modified. There was insufficient time to build new ailerons and still fly it during the 1961 season so that job is slated for the coming fall.

With the generous help of my brother Dave, new aft ribs and trailing edges were then built and installed. The refairing removed the airfoil's aft upper surface hump that was apparently triggering the objectionable flow separation. Also, the refairing included extending the trailing edge .10c aft and lowering it .03c, principally to increase the wing's lift during takeoff and landing. At the same time that the wing modifications were underway, the inboard speed-brakes were removed and the outboard brakes were increased in length by 40% to 42 inches span. Not only did the original speed brake installation create excessive buffet, but they were somewhat too powerful in that their wing drag was so high that it was quite difficult to safely land the sailplane with the

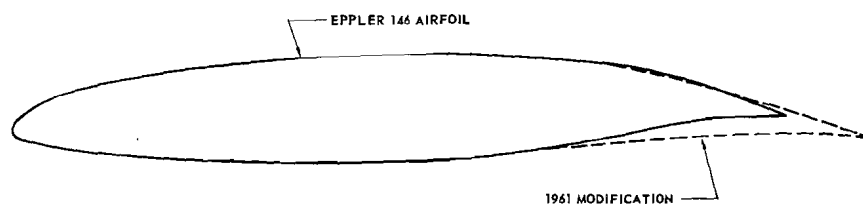


Figure 1.

brakes out.

By being careful with regard to weight and covering the aft modified portion of the wing with fabric instead of plywood as originally used, the wing modification reduced each wing's weight by 25 pounds, or a total saving of 50 pounds.

The ship was then test flown in June of 1961 and found to be very satisfactory in that all four of its major 1960 faults were either entirely removed or significantly reduced. Besides being 127 pounds lighter, its wing area is approximately 14 square feet greater.

Figure 2 shows the flight test performance polars that were obtained from flight tests of the original configuration during the fall of 1960. One curve is for the basic sailplane and the second is for the same configuration but modified by the addition of 660 small cardboard turbulators cemented to the upper surface of the wing along .8 chord line. These turbulators were added in an effort to reduce the flow separation, but as the data indicate they were apparently unsuccessful. Although the effects of the subsequent tail and

wing modification on Adastra's performance have not been measured yet, the estimated performance polar for the 1961 configuration is also shown on Figure 2.

Lift-off airspeed is now 37 knots compared to 55 knots and the indicated stalling speed is now 28 knots compared to the previous 35 knots (indicated and calibrated). No airspeed calibration or flight polars have been obtained since the modifications were made, but will be made sometime during the summer.

The effect of the airfoil modification is very noticeable and apparently did prevent premature flow separation because Adastra's climb performance is greatly improved. As would be expected because of the lighter flying weight and increased wing area, its high speed performance appears to be less spectacular than it was. However, when carrying a passenger the added weight will increase its cruise speeds but will detract somewhat from the thermalling performance.

TISSANDIER DIPLOMAS FOR 1960

Paul Tissandier Diplomas of the FAI for 1960 have been awarded to three Americans, Max Conrad, Mrs. Arlene Davis and Martin M. Decker. The diplomas are awarded to persons who have served the cause of aviation, particularly private and sporting aviation, by their work, initiative and devotion.

SLINGSBY T.49 FLIES

The British *Flight* magazine for Nov. 23rd reported that first flights of the Slingsby T.49 two-place sailplane were made on Nov. 4th. Certification flight tests will follow at Lasham. The T.49 is an all-wood, high-performance type with a laminar airfoil and side-by-side seating.

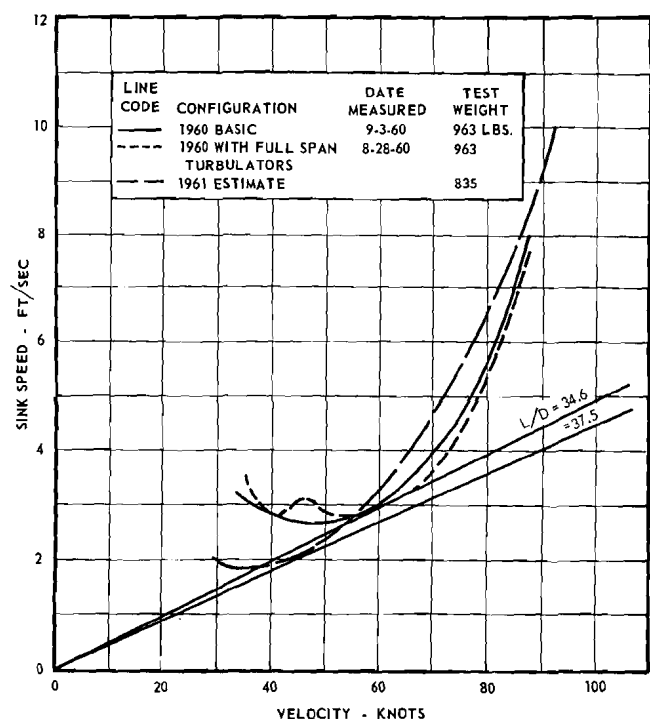


Figure 2.

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