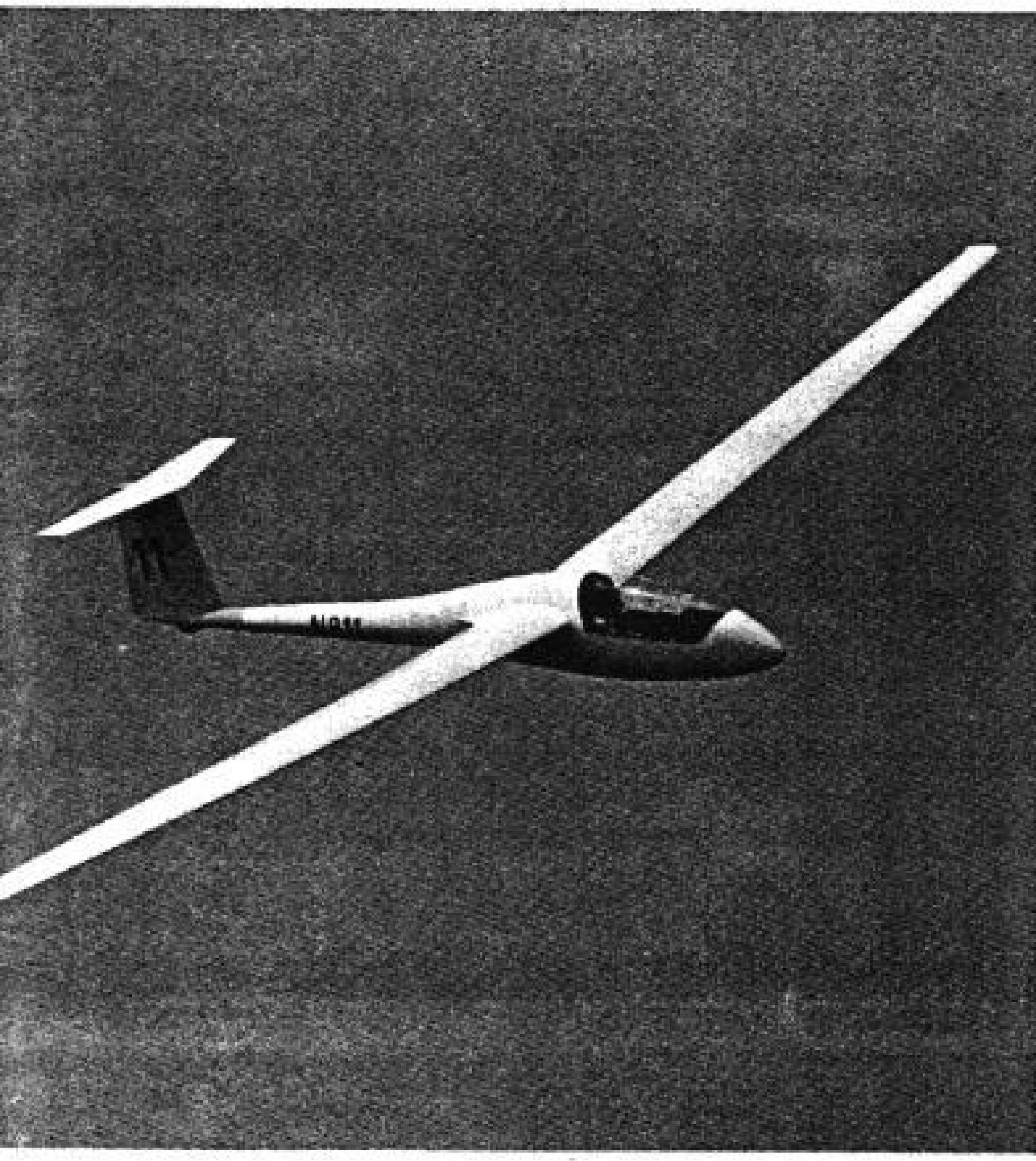
# A Flight Tes the Standar



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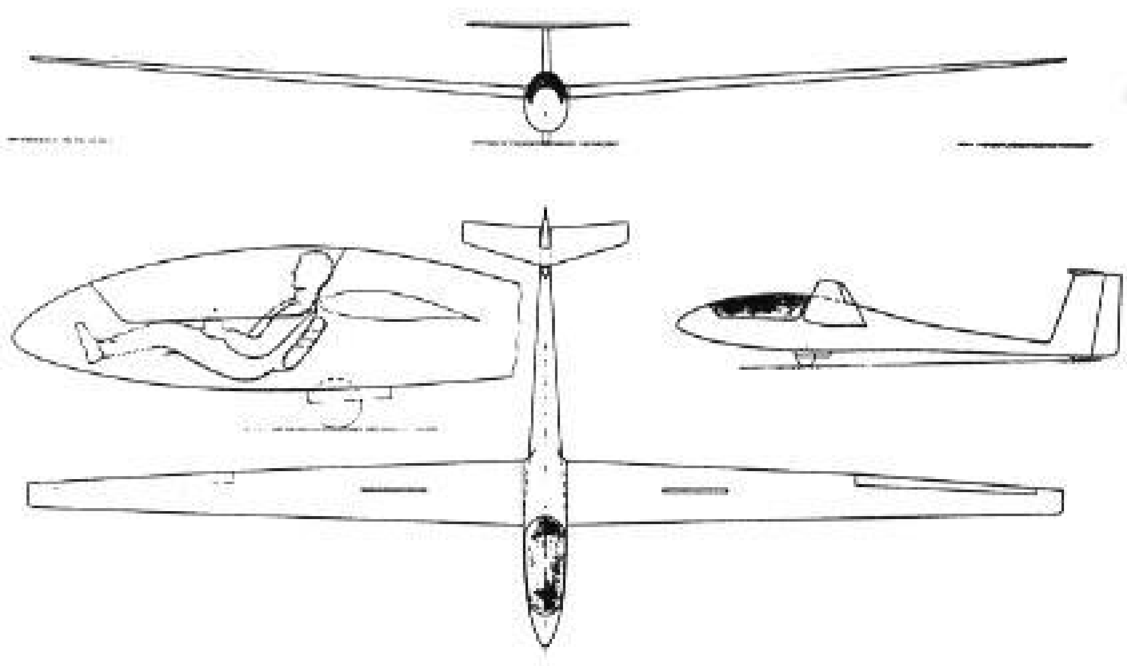

One of the outstandingly good features of the Standard *Cirrus* is its well-arranged cockpit. It is capable of fitting large pilots comfortably, has room for a normal-size instrument panel, and yet provides the pilot with excellent visibility. The controls operate freely and are well located. The one-piece side-hinged canopy opens and closes with ease and is much more convenient than the non-hinged removable type which usually must be placed on the ground or handled by an assistant while entering and exiting the cockpit.

Fig. 1 shows that its measured flight performance polar is relatively good, indicating an L/D max of about 35.9 at 51 knots calibrated airspeed, and about 440 ft./min. sink rate at 90 knots calibrated. The reason for the underscoring of the words "calibrated" is that one of the less good features of the Standard *Cirrus B* is its large airspeed system errors.

Fig. 2 presents the airspeed system error measurements that were made recently on Cully Culwell's N5CC. Its pitot source is in the fuselage nose, which is a good location. However, its static sources are located on the fuselage sides about four inches below the wing bottom surface and at roughly its mid-chord. At high angles of attack (low speed) these static sources naturally sense a higher than ambient pressure because a wing normally achieves its lift by generating above ambient pressures on its bottom side and below ambient pressures (suction) on its top surface. This higher-than-ambient static pressure sensed below 47 knots causes the airspeed indicator to read about one knot too low at low speeds.

The earlier Std. *Cirrus A*, reported by Paul Bikle in Reference 1, had its static ports located on the forward fuselage sides near the instrument panel. This location produced suction at all airspeeds, which caused airspeed indicators to read considerably high at all speeds. At stall this error amounted to about 2.5 knots high for the Standard *Cirrus A*, whereas the Standard *Cirrus B* shows one knot low, or a difference of 3.5 knots in indicated airspeed. This was excellent brochuremanship and resulted in many people actually believing their new *Cirrus* possessed 4 mph lower stalling speeds. At high airspeeds both the A and B models show considerable static port suction, such that the indicated airspeed is about seven knots above its correct calibrated airspeed. Again good brochuremanship, but no help in contest flying.

Please understand that though it might be desirable for the individual owners to move their airspeed static sources to locations producing less airspeed system error, to do so would be dangerous and contrary to certification. When any aircraft design or model undergoes certification tests, its airspeed system errors are carefully measured and included in the aircraft airspeed placards. The Standard *Cirrus* dive speed placard is 119 knots indicated airspeed. With the measured −7 knot correction (shown in Figure 2 at the redline airspeed), its actual calibrated redline is only 112 knots. Because of the large airspeed system static source errors on both Standard *Cirrus* models, use of these

# Evaluation of Cirrus B

by RICHARD E. JOHNSON

sources for variometers results in poor variometer performance.

Almost all thermal soaring includes sharing one's air currents with various small flying insects. Though not very numerous in the arid desert regions, their numbers and degrading aerodynamic effects through impacting and roughing the wing leading edges can be a significant factor to the sailplane's performance polar when flying in more moist regions. My limited flying in Germany indicated insect roughing posed a more significant effect there than anywhere in the U.S.A., and I have been informed that it is even worse in Finland. For this reason a flight polar measurement of the *Cirrus B* was performed with a pattern of simulated impacted insects stuck along the wing leading edges. These simulated insects were actually little squares of silver duct tape, about .01 inches thick and measuring about .20 inches on the sides. A pattern was used where one "insect" was placed each six inches directly on the wing leading edges, another row in between about one inch above the leading edge, and a third row also in between and about one-half inch below the leading edge.

This bug installation was fairly severe by U.S.A. standards, but the Standard *Cirrus* performed surprisingly well thus encumbered. Fig. 3 shows the measured "buggy" polar which indicates only a four percent decrease in L/D max. At 90 knots the "bugs" increase the sinking speed by about 14 percent. Next month's report will show a much more severe effect on the *Nimbus II* performance polar.

Mediocre flight characteristics of the *Cirrus B* are its longitudinal stability, control, and stalling. The longitudinal stability is relatively low compared to the PIK-20 or Schweizer 1-35, and this requires some additional pilot attention to maintain aero tow position or fly at constant airspeeds. At high airspeeds the control stick elevator pressures are quite low, and care must be taken not to overcontrol.

Some warning is given at stall, but the roll-off is fairly rapid and it apparently will enter a spin rather quickly. The earlier Standard *Cirrus A* was reputed to be worse in that regard, and for that reason the wing washout was increased about .75 degrees. For the above reasons, I would recommend that pilots with less than about 100 flying hours experience should not fly the Standard *Cirrus*. Experienced pilots with current proficiency should have little difficulty, and to those I recommend the Standard *Cirrus B* as an excellent sailplane.

The author is indebted to the Dallas Gliding Association for providing the five high tows needed to collect the performance flight test data presented, to Bob Gibbons of the North Dallas Glider Club for his work to reduce the performance data and prepare the computer generated polar plots, and to Cully Culwell of Dallas for the use of his fine sailplane for these tests.

REFERENCE

1. Bikle, P.A. "Polars of Eight," *Soaring*, June 1971.

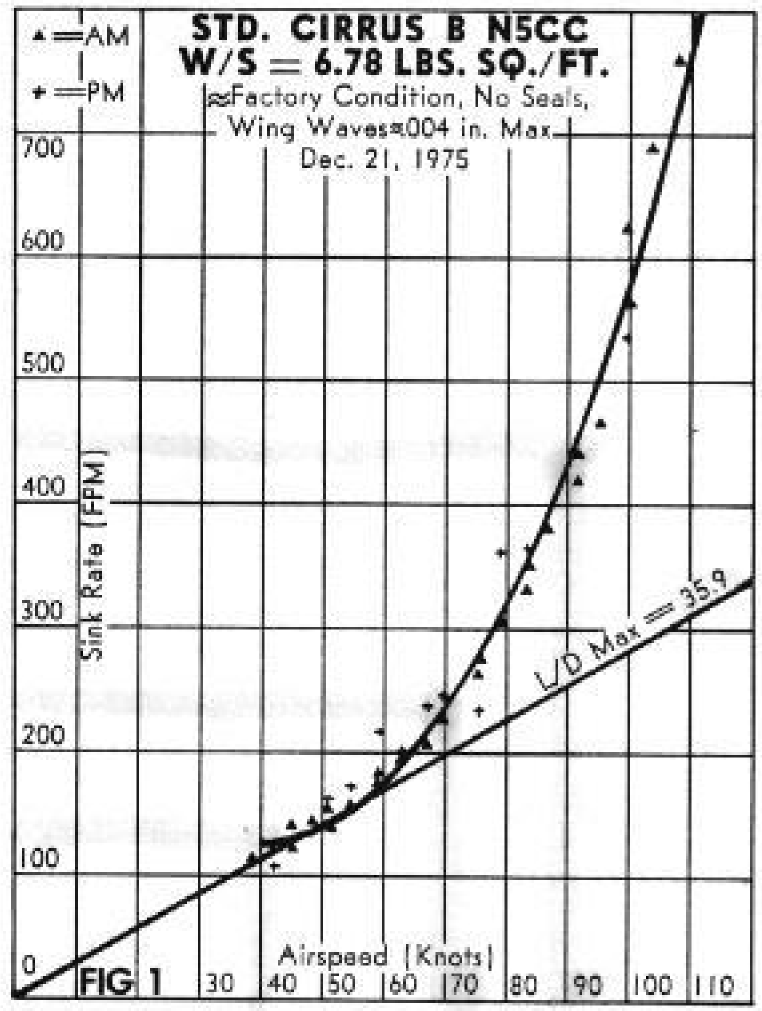


FIG 1

STD. CIRRUS B
AIRSPEED SYSTEM CALIBRATION
Nose Pitot, Fuselage Under Wing Side Static

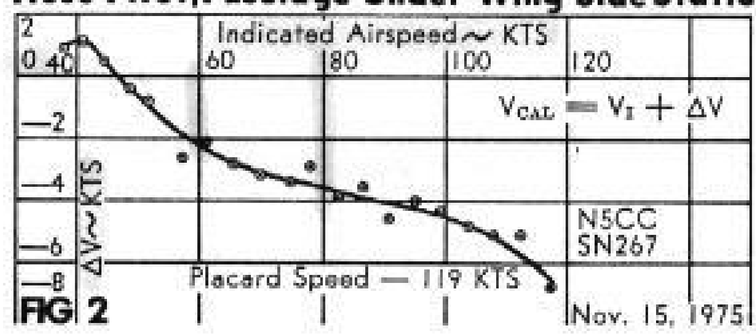


FIG 2

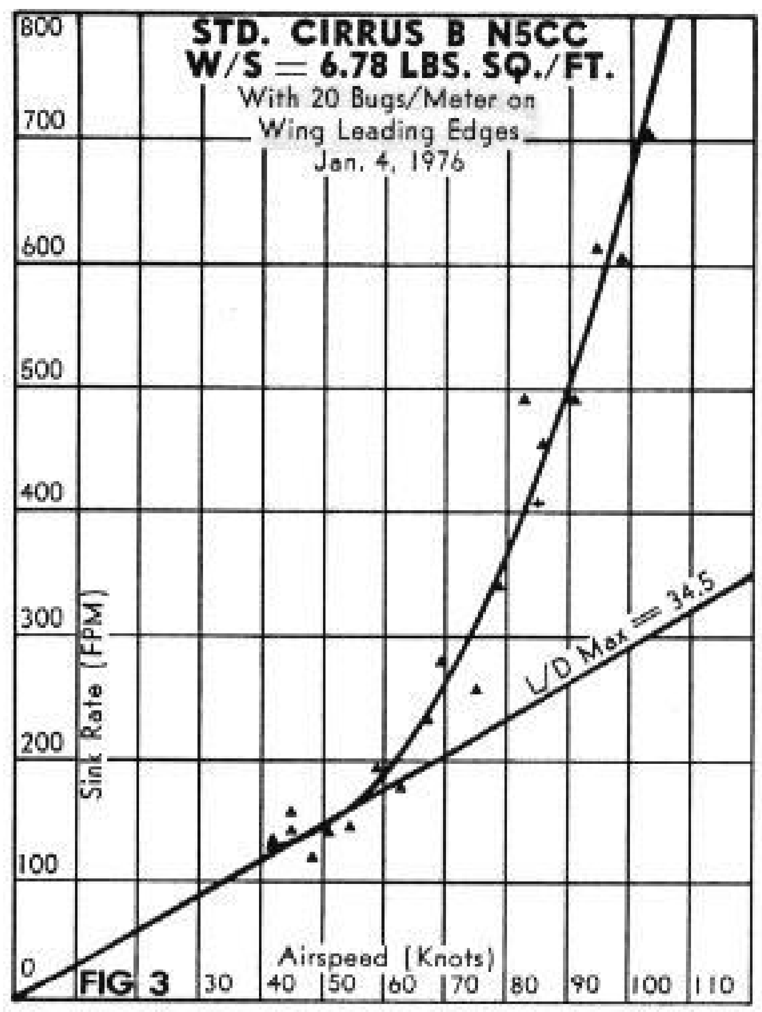


FIG 3