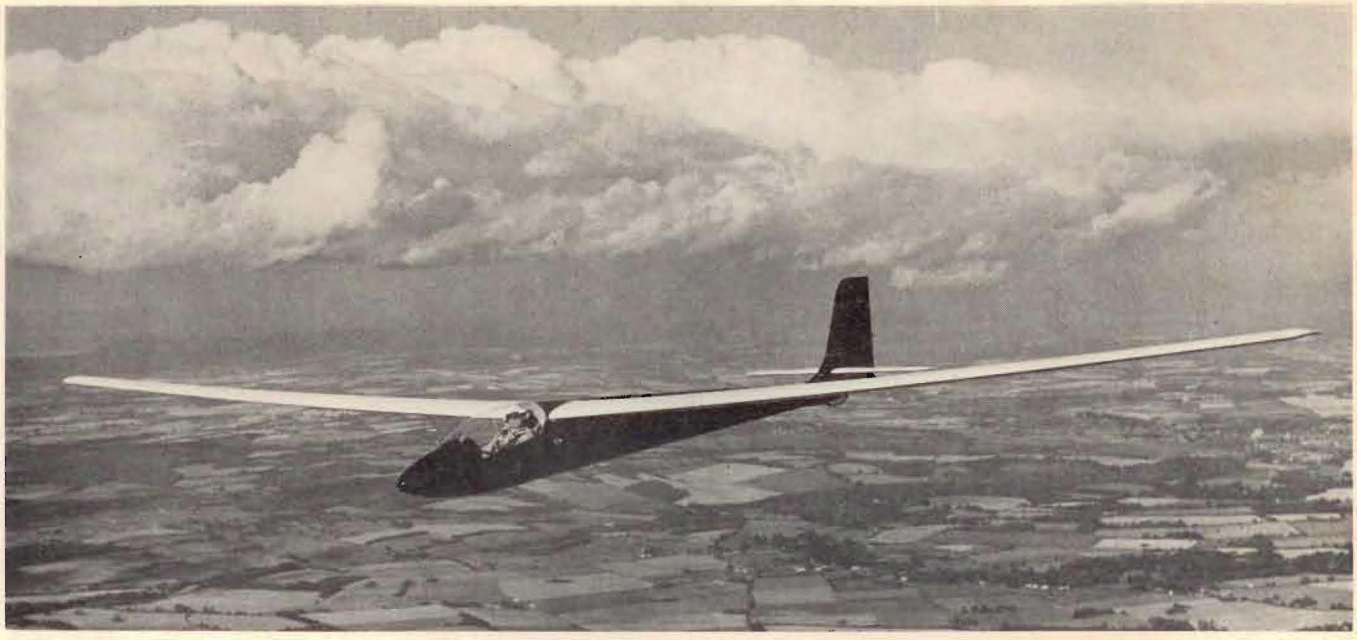

THREE YEARS IN THE LIFE OF THE DART

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This is the story of the Dart series, of the decisions and reasons which led to its creation and the trials and complications which accompanied its birth. Although these are now merely part of the history of Slingsby Sailplanes, for those of us who were concerned with the day to day development of the series it represents three years of our lives.

The soaring pilot does not usually realize what motivates a manufacturer into producing a new glider design. This is probably because, although both must be enthusiasts, the pilot fails to appreciate that what to him is luxury is bread and butter to the professional.

There is a saying that a hungry fighter is a good fighter. In the years 1963 to 1965 we were very hungry at Slingsby Sailplanes, but we believe the result was a good sailplane. In 1963 we were faced with an impending sales problem. The Skylark series, which had started with the Skylarks 1 & 2 in 1953, had been developed through to the Skylark 4 and was then being produced at a rate of one per week. Although the 4 proved itself to be unbeatable in weak conditions and achieved a remarkable contest record, winning both the U S and Canadian Nationals in consecutive years, the sales were dwindling with little prospect of increase. A number of improvements had already been projected for the Skylark 4 which would have produced the necessary uplift in both performance and sales, but it was obvious that no major design breakthrough could again be achieved with the series.

Early in 1963 the decision was taken to commence a design study for a brand new high-performance single seater to be ready for the 1965 World Championship. Our target was the OSTIV Design Prize.

Work was immediately started on studies to determine the basic configuration. These were assisted by computer analysis carried out in an Italian University. When the basis geometric parameters had been finalized wind tunnel tests were carried out at the Imperial College of Science and Technology to produce the optimum fuselage shape.

With these completed the design entered the engineering phase. Throughout this period considerable importance was placed on such items as ease of rigging, maintenance, visibility, cockpit size and comfort. These can play a vital part in club and competition flying.

Building work on the prototype was started in May, 1963, and by November we had the prototype completed. Flight trials of the prototype were uneventful and the performance appeared to exceed even our expectations. Over 80 aircraft were ordered in the first three months and jigs were established for large scale production.

In the summer of 1964 we began to hear rumors that the low-speed performance of the new ship was not up to expectations. An immediate investigation was carried out and careful flight measurement showed that just above the stall the sink rate was higher than we had expected. The explanation for this was not known for some considerable time. By October, 1964, our order position was almost zero. Throughout the winter of 1964/65 flight trials and investigation continued. Work was started on a metal spar to give a weight saving of 35 to 40 pounds, although it was realized that weight was not the only factor effecting the minimum sink.

The solution came when the first metal spar was being built. The wing-root sections had been inflated locally from 18 to 20 percent to provide more spar depth. Was it this 2 percent increase in a root chord that was causing the trouble? A careful re-examination of the wind tunnel tests revealed an element of doubt.

An immediate decision was taken to reduce the percentage depth of the root section by extending the trailing edge. Flight and evaluation on this first air