

THE

SCHWEIZER

SGS 2-25

by ERNEST SCHWEIZER

The need for high performance 2-place sailplanes has been evident for some time. At the end of World War II there was a serious shortage of sailplanes of any kind and one project considered was the improvement of the SGS 2-8 design (known as the AF TG-2). Some design work on this model, designated as SGS 2-18, was done. It was felt that due to rising costs it might prove too expensive to produce and that it was not an ideal training glider. A new two-place design was given preference and was developed and put in production as the well-known SGU 2-22, a practical and simple 2-place training sailplane. Some thought was given to providing this with higher performance wings, but with the flood of surplus 2-place training sailplanes (TG-2, TG-3, TG-4 and Pratt Read), this became economically unfeasible, and it was also not the ideal solution of a high performance 2-place. For several years the surplus trainers served adequately, holding practically all the USA two-place records.

Meanwhile, a series of more advanced single-place sailplanes were developed at Schweizer—the 1-21, 1-23, 1-23D and 1-24. These designs held more promise as a basis from which to develop a new two-place. About two years ago we made a design study of an advanced 2-place sailplane and a proposal was circulated among persons who had indicated a possible interest in such a sailplane. This aroused considerable interest, but cost was a problem which prevented a sufficient number of firm answers to permit proceeding on this project. In 1953 the need for a possible 2-place entry in the 1954 International was evident and it was decided that a prototype sailplane developed for this purpose would be useful in selling soaring generally as well as the sailplane itself. By February 1954 the USA International team seemed almost certain. It was decided at SAC to proceed with the design in the hope that a prototype

might be finished in time for the International Meet in England. Construction was begun in April and the ship was test flown in June leaving very little time for testing and improvement of the prototype before shipping to England. Its control, stability and performance characteristics were found to be excellent except that it was marginal in small field landing ability due to the DFS Type dive brakes which were not as effective as would be desirable on a heavy clean sailplane such as the 2-25. The wheel, a 500 x 5 with hydraulic brake, also was overloaded considerably as to weight and kinetic energy rating. As a calculated risk it was decided to proceed, and the only modification that there was time for was an additional band type brake for the periphery of the tire operated by the co-pilot. With the combined effort of both brakes it was possible to lock the wheel.

The ship performed quite well in England and was running second in the 2-seater category when it was landed in a very small and uneven field and overshot, winding up in a corner of timber fences with sufficient damage to the sailplane to put it out of the competition for the last day. Being out on one of the 4 days when contest flights were possible, it finished in 3rd place; a very creditable effort for the ship and pilots Stan Smith and Bob Kidder who had so little time to get familiar with the ship. They felt that the performance of the 2-25 was equal to or better than the other 2-place sailplanes against which they competed. The 2-25 has been repaired and was put in operation again in January 1955. The 2-25 is now being modified for some high altitude research work.

One of the basic reasons for building the sailplane was to have a ship available which could be used to indoctrinate experienced power pilots, both commercial and military, into soaring flight. Airline and Military pilots are accustomed to flying mod-

ern, expensive and well-equipped aircraft. Stepping into a surplus 2-place or a 2-22 trainer is not calculated to impress them very much, in fact, it may lead to prejudice them against all sailplanes. A modern rugged all-metal sailplanes with good instrumentation is much more impressive and puts them in a better state of mind to evaluate the potentialities of soaring flight. The 2-25 also serves as an excellent check-out ship for high performance single place sailplanes.

Aerodynamic Design

Due to the short time available for the design and construction of the prototype it was necessary to avoid any radical departure from past practice to insure a satisfactory sailplane at the first try. Aerodynamically the 2-25 is conventional Schweizer practice. The wing is very similar to the 1-23D with a NACA 43012A airfoil at the root and 23009 at the tip. However, since the 2-25 is a new design, the transition between the two airfoils is slightly different than the 1-23D which was developed from the existing 1-23 design by modification. In the basic design study the use of laminar flow wings was studied, but these were not used because the conventional airfoils gave a wider range of speeds at which good performance could be obtained. For a heavily loaded sailplane in which high cruising speed was the prime consideration the laminar flow airfoils would undoubtedly be superior assuming that one wants to go to the expense of getting the surface smoothness necessary to achieve laminar flow. In the 2-25 good slow speed performance was required and the airfoil chosen has good low speed characteristics as proven by previous designs. The stalling speed of the 2-25 with over 1200# gross weight including a lot of extra equipment is in the 36-38 MPH range and can be flown in the 40-42 MPH range for soaring. This indicates a C_L of about 1.6 at stall and a usable C_L of 1.2 to 1.3. Its cruising speed for 2 meter sink is over 90