

# 1961 SSA TECHNICAL SYMPOSIUM ON SOARING

by FREDERICK H. MATTESON

On September 16th, the second SSA Technical Symposium was held at the IAS Building in Los Angeles. Weather described by Californians as "heavy dew" did not seem to hurt attendance; most of the 200 chairs set up were filled and the Symposium would thereby pay its way. Those in attendance and participating came from various corners of the country. Large groups came from out of town with San Diego, Edwards and Northern California noted in particular.

The meeting was opened with a welcoming address by SSA President Paul Bikle who also introduced the first speaker, a fellow member of the NASA staff, C. Don Cone, Jr., from the Langley Research Center in Virginia. The SSA had invited NASA to participate in the Symposium and they in turn invited their scientists to propose papers. Mr. Cone's "The Design and Performance Optimization of the Thermal Sailplane" was chosen and the necessary analysis was sponsored. This represents the first research directed at the sport of soaring by NASA since its establishment from the original NACA. The investigation of the thermal sailplane was very comprehensive, covering development of the vertical velocity in thermals represented by a vortex ring and the vertical sinking velocity in turning flight for a family of sailplanes. From these, optimization of the aircraft was derived for climbing flight. Other facets of design such as stability and penetration were investigated. Mr. Cone furnished a 74-page report of this work. Copies of this report may be obtained from the NASA, Langley Research Center.

Sterling Starr of San Diego presented the second paper entitled, "Possible Performance Improvements — 1-23 Series Sailplanes." Mr. Starr first analysed the National Championships and the correlation between performance and placing. Establishing a performance level, price limitation and other requirements led to the desirability of examining the possible performance improvements which might accrue from modification of his 1-23D sailplane. Modifications were shown to result in modest improvements. To

achieve the desired level of performance, a new set of wing panels would have to be constructed. The engineering aspects were investigated and the sailplanes compared by means of scale models.

The last paper in the morning session was presented by Bruce Carmichael, who not only has been the guiding light of the Symposiums, but also has presented papers and sparked the discussions of others. In "Possibility for a One Foot per Second Sinking Speed" he set out to determine whether it might be possible to construct a machine in which one could stay up in almost any weather. Research of actual aircraft in history showed that the muscle-powered aircraft of the 1930's have come closest to the goal of one foot per second sinking speed. Using modern airfoils and data from Haessler for muscle-powered machines it was shown that this goal was attainable with a reasonable sized glider.

The afternoon session opened with Vic Saudek's "Some Personal Comments on Sailplane Design." His comments were chiefly on the subject of cockpit design and its effect on safety and convenience. Because this paper has appeared in two parts, in the October *Soaring* and in this issue, further description need not be made here.

Although the drizzle did not daunt the audience, it made it difficult for Ray Parker to bring his unpainted new all-wood sailplane to the hall for display. Nonetheless, by midmorning the sun came forth and Ray and Al Backstrom had it set up in the entrance hall for all to examine at noon. This writer has never seen a more beautiful example of the aircraft woodworker's art than that which Ray has produced in his latest and finest. In "The Sailplane T-Bird — Its Design Philosophy," he spoke of the design decisions, choice of materials and processes and conveyed very effectively the joy and satisfaction in producing a beautiful sailplane from inception to finished craft.

Al Backstrom came from Dallas, Texas, to relate progress on the new laminar airfoil flying wing in his "A Different Approach to High Per-

formance." He told of the development of the new "Plank" from the EPB-1 and gave details of the construction. Early flights disclosed problems arising from the NACA 8-H-12 airfoil, for which modification of the machine is underway. Following Al's paper Dave McNay described a new ship evolved from the Plank.

The first meteorological paper of the sessions was "Instruments and Techniques for Locating and Utilizing Thermals" by Paul MacCready, Jr. He made a very thorough study of possible means of improving the locating and using of thermals. Following the analysis of physical characteristics of thermals he suggested many methods of detecting these characteristics. His paper has appeared in the Swiss *Aero Revue* for July, 1961.

Dewey J. Mancuso of San Diego gave the second paper in the field of meteorology. "Flying and Meteorological Aspects of Atmospheric Waves" was an account of a series of wave soaring expeditions to various sites in Southern California. Illustrating his paper with beautiful color slides, he correlated the weather situations with cloud forms. He discussed pre-frontal and post-frontal waves, travelling waves and gave pointers on equipment and techniques for those contemplating wave flight.

The last paper was "A Design Proposal for a Minimum Weight Glider" by Professor P.B.S. Lissaman and LCDR R. H. Belter of the Naval Postgraduate School at Monterrey, California. The theme of this paper was to examine a glider designed not for performance but for pleasure, related to a high-performance sailplane as a sailing dinghy might be to a racing yacht. "Le Minimum," as the glider is so appropriately named, is a 34 ft. span machine weighing 120 pounds. Synthetic materials were discussed. A delightful presentation made this paper a pleasant close to the 1961 SSA Symposium.

These papers are scheduled for publication in future issues of *Soaring*. It is hoped that their appearance will inspire new papers for future Symposia.

In the evening the group was invited to the home of the Herman Stiglmeiers to enjoy informal chats, color slides of the 1960 Internationals and refreshments.