

AMERICAN SOARING TECHNIQUES

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National and International Soaring competitions act as milestones of man's progress in his conquest of the skies by powerless flight. Since World War II there have been three important milestones marking noteworthy contributions to the science of soaring, two by American pilots. These two American contributions have resulted in a distinct American Soaring technique of which the chief characteristic is speed. Competitions tend to establish the worth of these contributions before they become universally accepted.

The first contribution was made by Paul MacCready, Jr. This contribution came to be known as the MacCready Optimum Speed Selector for determining the best speeds between thermals for all sailplanes. After trying it out in 1947 and 1948 MacCready published his method in the November 1949 *Schweizer* (Swiss) *Aero Review*. This is the first mention of this contribution in soaring publications. Unfortunately the article was in German and not readily available to the U. S. pilots.

Shortly after this Richard Johnson made his contribution along the line of the development of the sailplane. He built the first practical sailplane with laminar flow airfoil wings. It was the highest performance sailplane in the world (at least up until 1955). His accurate performance tests made under the guidance of Dr. A. Raspel did much to start a whole new trend in sailplane design with laminar flow airfoil wings and emphasis on penetration. Now Maxey has taken up where Johnson left off. Both of these pilots were National competitors over ten years ago—long before the development of the planes associated with their names.

In the Internationals of 1952 appeared the third contribution. The British team all had their planes equipped with total energy variometers. This contribution evolved so

no one person can be given credit though Frank Irving had as much to do with its perfection as anyone. Reference was made to the total energy variometer by Barringer (Flight without Power) who got his information from Germany. At least it was recognized as a possibility back in 1940.

At the Internationals in France in 1956 over half of the sailplanes were equipped with Optimum Speed Selectors and Total Energy Variometers. And half of the single place planes had laminar flow airfoils, flaps, etc. This shows these three contributions are quite generally accepted today.

This article will discuss only the first contribution since the other two have been extensively covered. There are several articles in *Soaring*, *Sailplane and Glider* (Jan. 1952) and other aeronautical publications for 1951 by Johnson, Raspel and Carmichael on the development, improvement and performance of the RJ5. The use of the total energy variometer as perfected for the British team was described by Irving in *Gliding* (Summer 1952). It was elaborated in *Soaring* in an article by MacCready (May-June 1954). The discussion of the development and acceptance of the MacCready Speed Selector will be in non-technical terms as befits a crewman. Of course practical meteorological knowledge may be a very large factor in the results and this can't be highlighted. The fact that MacCready used six different planes in these various competitions would indicate that in his case at least the plane itself was not the decisive factor. In this discussion distance and speed are taken to be synonymous.

In 1947 MacCready had acquired the "Screamin Wiener" from Paul Tuntland. This was a cute little sailplane of 36 ft. span and the precursor of the Rigid Midget and the Tiny Mite. It was not a high performance plane but to a crewman whose initiation had been with the monstrous

Pratt Read, plus ballast (rules of 1946), plus the biggest, heaviest trailer ever built, it was a cute plane.

As soon as Paul graduated from Yale at the age of 21 he headed for the Texas Nationals. He had a very naive crew of Gordon Neiswanger and myself and took along six Aircraft Indicators variometers, none of which he was able to sell for \$60.00. He had not been able to fly the "Screamin Wiener" even once before he got to Texas. But while majoring in physics at college it seems he had done a lot of figuring on the scientific side of soaring. I have just run across some of these papers in cleaning out the attic. It remained to be seen if he could translate his theories into practice. That meet with its International flavor was the biggest and bitterest marathon (every day an open day) that has ever been staged.

The fact that Paul made the most 200 mile flights (including his world record goal and return flight of 230 miles) would indicate that he was using a technique that was in some way different. On the last day of this meet, that great pilot Johnny Robinson showed what he was capable of and set a new American record of 333 miles.

One flight which MacCready did not win will serve to illustrate his early use of his Optimum Speed Selector. This was the flight toward New Mexico where Comey, who won this championship, made 300 miles and Nessler, the French Champion made 313 miles. Nessler was flying the French Air 100 (quite comparable to the Weihe) with an L/D ratio of 31 to 1 and a minimum sink of 1.7 f.p.s. at 44 m.p.h. Comey was flying the new Schweizer 1-21 which had an L/D ratio of 27 to 1 and a minimum sink of 2.2 f.p.s. at 37 m.p.h. but with much better penetration qualities. Paul's little "Screamin Wiener" had a minimum sink of 3.3 f.p.s. at 45 m.p.h. and an L/D ratio of 20 to 1. On this day Paul started one full hour behind Comey and Nessler yet at 175 miles he had caught up with them and entered the same thermal but quite definitely below them, as Comey stated the next day. Unfortunately at 227 miles Paul dove into the wrong side of a thunderstorm and came down in a hurry. However, this was visible proof that his Optimum Speed Selector was a success.

MacCready sold the "Screamin Wiener" and obtained the Orlik, a

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