

FLYING IN THE 1956 INTERNATIONALS

The International Glider Competition in France, July 1, 1956, was the fourth international and fifth national contest in which I have flown, and of all it featured the greatest variety of flying. Here is a description of the flights—not a complete account, but the story of the most important parts and the reasons for the decisions made.

First let me digress and mention a few points about the contest and equipment. The contest organization was magnificent; if the U.S. ever hopes to sponsor the Internationals it will have high standards to meet. The towing could not have been finer—60 sailplanes in 30 minutes, every time. The selection of tasks was also generally the best possible, which required good judgment, forecasting, and luck. My crew, consisting of my father, Lawson Willard, and Denys Manificat from France, was a major factor in my success.

For four days prior to the meet there was an opportunity to practice during strong cumulus conditions. This afforded me the chance to become acquainted with the new Breguet 901 which I had been loaned. The Breguet is certainly the best (and most expensive) sailplane I have flown. It is a superb compromise between high glide ratio, low sinking speed and low spiraling speed (with flaps), maneuverability, wonderful landing characteristics with flaps, spoilers, and retractable gear, and ease of assembly. The true glide ratio must be close to the 35:1 listed. Optional water ballast was provided, but I always left the tanks out because the meteorological conditions did not warrant their use. Spiraling was about 41 mph indicated, with 12 degrees of flap. With full flaps and spoilers the terminal velocity is under 80 mph—using the flaps and spoilers makes landing in tiny fields no trick at all even for a pilot who has made few practice landings. On several occasions I picked a small 600-foot field, then during the approach worried about its size and so landed as short as possible—and found I did not need

by DR. PAUL B. MACCREADY, JR.

the last 400 feet. Removing the glider from the trailer and assembling it could actually be done in 5 minutes, if one were in a rush.

This matter of slow spiraling speed with flaps is worth discussing here at greater length. Twelve degrees of flap is supposed to increase the sinking speed about $1\frac{1}{2}$ inches per second, but decreases the spiraling speed by a few miles per hour at the same time. Being able to spiral tighter is far more important than the slight in-



Paul MacCready and the Breguet 901 at Bouthéon Airport after a speed dash. Note the total energy venturi mounted behind the cockpit and the yarn yaw indicator on the nose vent.

crease in sinking speed; this advantage becomes apparent not only in thermals but also in turbulent slope soaring conditions. One should utilize the good slow speed characteristics by spiraling at an angle between 30° and 45° , at a speed very close to a stall.

The variometer is the most vital instrument for soaring. In France I was fortunate in having 1) An "Aircraft Indicators Company" sensitive rate of climb indicator which I purchased 9 years ago, and 2) a Badin Model 100 French variometer. The Badin and the Aircraft Indicators Company instruments are both extremely sensitive and have the best possible response speed. Slower response would be a hinderance, while faster response would be confusing and would have to be slowed to give

the best information to the pilot. Since the Badin model has a linear scale, it was used with the "Ring Scale Airspeed Selector."* An Irving "Total Energy Venturi" was also used with the Badin instrument. During accelerating flight this eliminates "stick-thermals" from the indication and helps show the vertical air motion rather than the vertical glider motion. It is a simple tool that is an absolute must for all distance soaring.

My policy on all flights was caution—and it paid off. The idea was to do moderately well each day rather than spectacularly on any day at the risk of occasionally doing poorly. All

the other pilots had one or more bad days mingled with their good ones. I was the only pilot to complete all three races, even though I was about the slowest on two of them.

A good sailplane is certainly an asset, but not all important. An old Olympia flown by Feddersen of Denmark actually made some spectacular flights, and was one of only five sailplanes to complete two of the three races. Five of the sailplane types were represented by three or more entrants. Of 4 Skys, the average final position was 12th, 4 Skylark 3's averaged 14th, 3 Jaskolkas averaged 21st, 7 Breguet 901's averaged 23rd, and 5 Air 102's averaged 29th, all out of 45 single place sailplanes.

June 30. Free distance flight to

*Soaring, March-April, 1954.