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Care must be used not to dump the flaps several notches at once as the sensation is not always comforting. Usually the ship is flown all the way in with the left hand holding the flap lever and the right hand on the stick. Airplane towing is very comfortable at 65 mph; spirals seem best at 45-50 mph; approach speed is usually 40-50 mph; and touch down is less than 30 mph.

Actual performance data is difficult to give at this time due to conflicting data taken at different times during the late summer and under different conditions of wing surface smoothness. Although a minimum sinking speed of 3.3 fps at 0° flap is reproducible via stopwatch and altimeter at almost any time, much lower sinks were noted prior to the deterioration of the contours. The best glide ratio is reproducible at 22 to 1 any time but will probably show up higher when accurate airspeed calibration is made. The use of flaps for glide path control gives 7 fps sink at 30°, 11 fps at 40°, and 15 fps at 50° at the

usual landing approach speeds.

Accurate performance data will be available later when Dr. August Raspet and his staff in the Aerophysics Department of Mississippi State College complete flight tests and make possible refinements during the winter months. A minimum sink of 2.5 fps with 10°-20° flaps and a glide ratio of 31 to 1 with 0° flaps are felt to be possible as a result of cleaning up and careful flight testing. At any rate, by this flight research, we should learn something of the effect of full-span flaps on the performance characteristics of laminar flow airfoils, as well as their general behavior in landing control. If a good home-built sailplane evolves, that will be welcome news also.

No description of a project of this kind would be complete without acknowledgement of all the help received from many friends during its design, construction and flight tests. The friendly spirit of cooperation which pervades the soaring fraternity makes much easier the completion of a project of this kind.

NOTE OF EXPLANATION

Reference: The article "THE LOW DRAG SAILPLANE," appearing in Nov.-Dec. 1954 SOARING.

The size and reproduction processes employed for the "curves" furnished with this article by Dr. Raspet and Mr. Parker, produced, unfortunately, a rendition that was not up to the desirable standards of this publication.

We are pleased to be authorized by the Engineering and Industrial Research Station at Mississippi State College, State College, Mississippi, to say that any reader desiring more legible copies of these illustrations plus an additional figure that was inadvertently deleted, may have the same by merely making the request directly to the College.

SOARING continues to be greatly indebted to Dr. Raspet and his staff at the Research Station for what we consider to be some of the World's foremost technical articles relating to motorless flight.

We are sure that our readers realize these papers by Dr. Raspet and his staff are a very considerable contribution to the advancement of our science and represent no little time and effort on the part of the authors. A letter to Dr. Raspet acknowledging your interest and appreciation would, we are sure, make him feel adequately compensated for his splendid efforts.

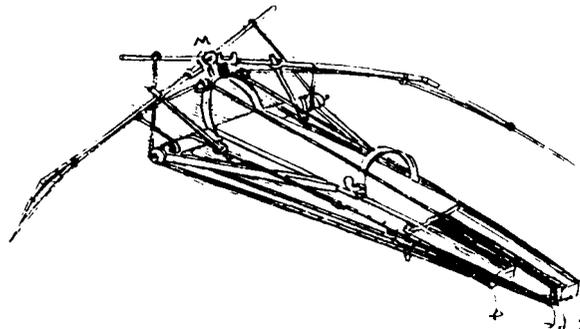
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the helicopter. Yet here again we see the results of his ornithopter obsessions in the off-hand way he deals with these two important vehicles. For each is represented in his notebook by a single sketch and a mere handful of words.

"If a man have a tent made of linen of which the apertures have all been stopped up, and it be twelve braccia across and

lems of flight scientifically. Although he had always been interested in bird flight as ground work for the study of human flight, it was not until after 1500 that he fully concentrated his attention on the subject and came to write his treatise *Sul Volo degli Uccelli* (On the Flight of Birds) in 1505. In this and many other notes he deals with every form of flight, including gliding, soaring, and flapping."

Leonardo's sketch for an ornithopter. "This machine," he says, "should be tried over a lake and you should carry a long wineskin as a girdle so that in case you fall you will not be drowned."



twelve in depth, he will be able to throw himself down from any great height without sustaining any injury."

"If he had done nothing else in the sphere of aeronautics, Leonardo's work on bird flight would have placed him as the first man in history to investigate the prob-

"But we must nevertheless regret that in the department of his life devoted to the air Leonardo allowed himself to be held back misdirected by his complex emotional nature, a misdirection which held him away from the fixed wing glider which he might well have pioneered."

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outboard panels. The elevator is one-piece, attached to a very small fixed stabilizer. The single cockpit is open, with the wing pylon doubling as a streamlined head-rest for the pilot. No wheel is fitted.

Careful tests revealed that the CLIPPER has an L/D ratio of 25 to 1, good even by today's standards of performance. The ship was built for shock-cord launching and for landings in the rough eastern Washington desert terrain, with the result that it is heavy structurally, and approaches acrobatic load factors. About the only objection modern pilots would raise when flying it would be about the aileron control. The ailerons are non-differential, which, coupled with a fifty-foot wing, make turning quite a laborious process. With this one modification accomplished to make it more suitable for tight circling flight, a comparison between the old slope-soaring CLIPPER and a modern sailplane would be most interesting...