

The High-Speed WLM-1

By RENE COMTE

THE features which pilots require in a modern sailplane are many and varied. They often contradict each other and it is not possible to incorporate all of them in the same ship without exceeding reasonable manufacturing cost. Many combinations have been tried and the practical results obtained show that each ship has certain advantages over the others, but each has its shortcomings.

The Messieurs Weber, Landolf and Muench of the WLM Engineering Office in Lucerne, Switzerland, made an extended inquiry among pilots to determine the features that should be incorporated in a new design. This was to be not exclusively a high performance sailplane, but was also to be used for training in aerobatics and cloud flying as well as for training power plane pilots. The possibility of using the ship to train pilots in the Swiss Air Force was also considered.

As a result of this inquiry the WLM-1 came into being. Three of these ships have now been constructed. They combine these main features: high strength, high placard speed, good stability in turns for cloud flying, good angle of glide at high forward speeds, low stalling and landing speed, good manoeuvrability (the combination of good manoeuvrability with low stalling speed was considered more important for successful thermal flying than extremely low sinking speed), good visibility and comfort for the pilot.

To obtain the above-mentioned features in speed range, airfoil flaps were used. The profile is NACA 23013 in the wing center section and NACA 23007 in the wing tips. Maximum thickness is 13% at the root. The cantilever wings are built with two spars and covered with plywood back to the rear spar. The cambered flaps are mounted along the whole length of the wings, from the fuselage to the ailerons. Diving brakes are mounted between the rear spar and the flaps. The dive brakes open above and underneath the wing and effec-



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185 m.p.h. with Safety

tively keep the terminal velocity of the ship within safe limits.

The wings are mounted on the fuselage by means of three pins and a fourth pin connects the two main spars. The fuselage is of the semi-monocoque type with plywood skin. The entire ship is covered with fabric. Control surfaces are mass-balanced. The elevators can be folded up beside the rudder for trailering.

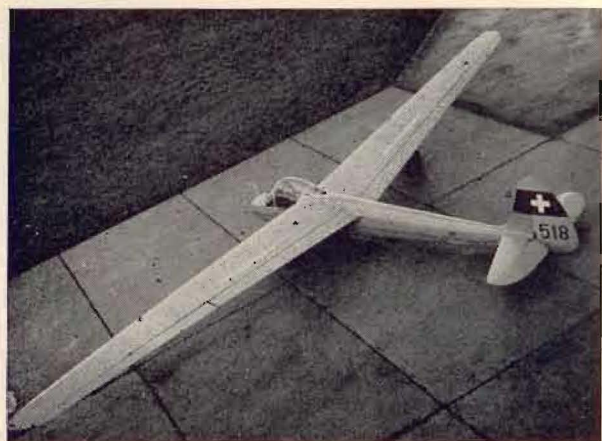
The cockpit is very comfortable and the arrangement of instruments and control levers is similar to that of a power plane. The complete dashboard includes two variometers, instruments for cloud flying, acceleration indicator, temperature meter and instruments for the oxygen supply besides the standard equipment. A large handwheel on the left side moves the flaps downward to a maximum angle of 40°. The slotted ailerons follow this movement up to 20°.

Specifications: span 45.93 ft.; length 23.00 ft.; wing area 150.7 sq. ft.; aspect ratio 14:1; empty weight 430 lbs.; disposable load 185-255 lbs.; gross weight 615-685 lbs.; wing loading 4.1-4.5 lbs. sq. ft.

Performances at sea level, wing loading 4.1 lbs./sq. ft.: minimum sinking speed 2.6 ft/sec. at 41 m.p.h. (flaps 10°); maximum gliding angle 25:1 at 51 m.p.h. (flaps 5°); minimum landing speed 29 m.p.h. (flaps 40°); cruising speed 78 m.p.h at 6.5 ft/sec. sink.

The WLM-1 was built by the firm of A. Isler in Wildeg, Switzerland, and the first ship of this type was completed in the summer of 1947. It was flown in the 1947 International Contest in Samedan by Max Schachenmann, who finished second. After the Contest

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The WLM-1 at Rest — Note Full-Span Flaps