

AIRCRAFT CIRCULARS
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 97

THE AMIOT S.E.C.M. 110 C.1
A Single-Seat Pursuit Monoplane

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THE AMIOT S.E.C.M. 110 C.1.*

A Single-Seat Pursuit Monoplane.

The principles governing the design of the Amiot S.E.C.M. (Société d'Etudes et de Constructions Mécaniques) 110 C.1 were determined by the operating conditions of pursuit airplanes in aerial combat. In order to satisfy these conditions fully, a modern pursuit airplane must have certain characteristics, including, first of all, a very high speed.

In the course of very extensive aerodynamic investigations, the constructors of the Amiot 110 discovered important facts concerning the differential action of the ailerons. They learned, in particular, that the act of raising both ailerons simultaneously and equally produces, as regards the coefficients of torsion, the same effect as the deformation of a wing having a profile of double curvature. This airplane was therefore provided with a special device enabling the pilot to control the torsional moment of the wings. This device preserves, for normal flight and landing, the properties of a wing with medium curvature, namely, a good grip in turning and low minimum speeds, while affording the possibility of diving with safety at very high speeds.

*From Les Ailes, May 16, 1929.

Accelerations of ten are possible in aerial combat. A pursuit airplane must accordingly be capable of withstanding such accelerations, taking into account the limit of elasticity of the materials, which must never be exceeded. In the case of duralumim structures, the load factor at failure would be fixed at 18. This is considerably exceeded on the Amiot 110, which has attained a load factor of 20. This result entailed an increase in weight, so that the airplane classes above the "jockeys," whose load factor is 12.

The figures given further on under the head of performances were obtained in official tests. In considering them, it will be noted that, due to its fineness, the Amiot 110 is not handicapped by its excess weight and that its climbing qualities are satisfactory.

The wing consists of two parts joined to a cabane at a considerable distance above the fuselage. Moreover, each half-wing is supported by a pair of struts joined in V to the iron fitting of the rear landing strut.

The wing section or profile is thick and uniform throughout the span. It has no dihedral angle, but does have a decided sweepback. In addition to the main wing, the Amiot 110 has two stub wings, attached to the lower part of the fuselage, containing fuel tanks. This is one of the interesting details of this airplane.

The ailerons, not balanced, cover the entire trailing edge. A special device enables them to act simultaneously in the same direction. They are operated by rigid controls. The external controls and horns are enclosed in a fairing.

The wing structure is all metal as also the covering, the latter consisting of plain sheets. It is applied on the well-known principle of the S.E.C.M., as perfected on the series airplane 120 B.P.3.

The fuselage framework and covering are both of light metal. The pilot's cockpit is behind the wing. Nevertheless, in order to improve the visibility, the wing is largely cut away above the fuselage.

The horizontal tail surfaces consist of a fixed stabilizer and a two-part balanced elevator. The vertical tail surfaces are a fin and a non-balanced rudder.

The Amiot 110 C.1 is equipped with a 500 HP. Hispano-Suiza engine, cooled by Lamblin fin radiators attached to the landing-gear struts.

As already mentioned, the fuel tanks are contained in two small auxiliary wings. A small central gravity tank assures the continuity of the fuel delivery in any position of the airplane. The tanks can be dumped immediately in the event of their being damaged by bullets.

The axleless landing gear consists of two rigid parts. It has a track gauge of 1.7 m (5.58 ft.). Each part, in the form

of an inverted pyramid, carries an elastic S.E.C.M. wheel. The shock absorbers consist of rubber strands enclosed in the hubs. The maximum travel of the shock absorbers is about 80 mm (3 in.).

A very strong tail skid is mounted under the fuselage just below the leading edge of the horizontal stabilizer. (Drawings and views are given in Figures 1, 2, 3, and 4.)

General Characteristics

Span	10.5 m	34.45 ft.
Length	6.5 "	21.33 "
Height	2.8 "	9.19 "
Wing chord	2.2 "	7.22 "
Wing area	21 m ²	226.04 sq.ft.
Weight empty	1120 kg	2469.2 lb.
Load carried	380 "	837.7 "
Full load	1500 "	3306.9 "
Wing loading	71.4 kg/m ²	14.62 lb./sq.ft.
Power "	3 kg/HP	6.52 lb./HP.
Power per unit area	23.8 HP/m ²	1.21 HP./sq.ft.

Performances

Max. speed near ground	290 km/h	180.2 mi./hr.
" " at 4000 m (13123 ft.)	275 "	170.9 "
Min. flight speed	95 "	59.0 "
Landing speed	80 "	49.7 "
Climbing time to 4000 m (13123 ft.)		8 min.
Ceiling	8000 m	26246.0 ft.

Translation by Dwight M. Miner,
National Advisory Committee
for Aeronautics.



Fig.1



Fig.2

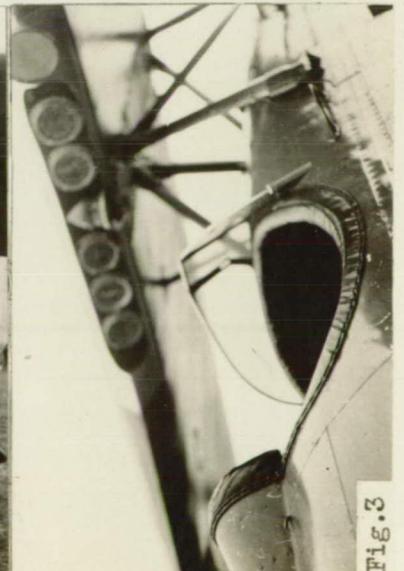


Fig.3

Views of S.E.C.M. Amiot 110 pursuit airplane. (500 HP Hispano-Suiza engine.)
13068 A.S.

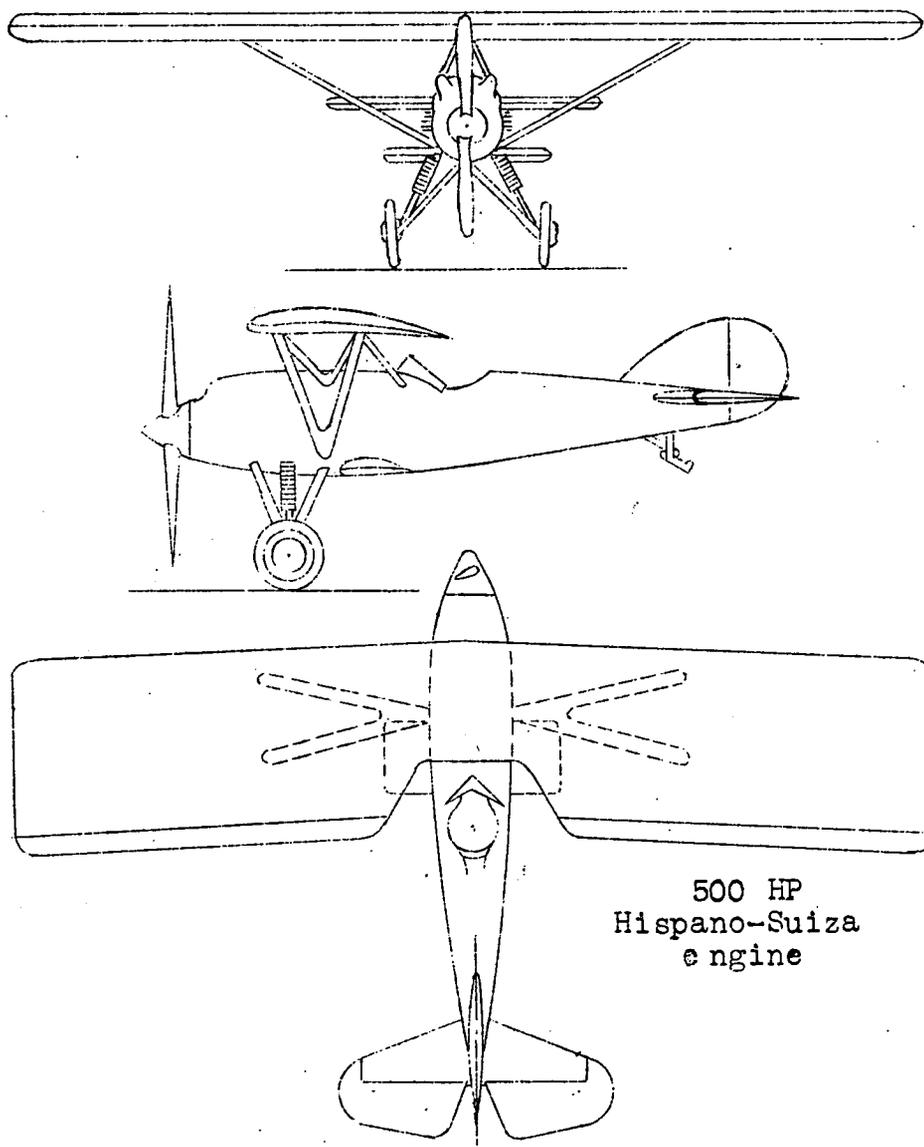


Fig.4 Amiot S.E.Q.M. 110 C.1 airplane.