AIRCRAFT CIRCULARS

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 75

MORANE-SAULNIER 121 SINGLE-SEAT PURSUIT AIRPLANE (FRENCH)

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MORANE-SAULNIER 121 SINGLE-SEAT PURSUIT AIRPLANE (FRENCH).*

By J. Serryer.

The M.-S. 121 has the general appearance of the new Morane-Saulnier training airplanes. It has an excellent visibility, a quality inherent in the "parasol" type. During its official tests under the supervision of the S.T.I.Aé., it proved to be a remarkable climber. Much can therefore be expected of the new airplane (the one equipped with a Jupiter engine), which is being built in the Puteaux factory.

The cell.- The M.-S. 121 is a parasol monoplane, a type originated by this firm in 1913. It has wings of uniform medium thickness throughout the whole span of 9.8 m (32.15 ft.). The wings have a uniform chord of 1.7 m (5.58 ft.). They have no dihedral, but a very pronounced sweepback. They are fastened, in the middle, to a metal cabane. They are rigidly held, on each side of the fuselage, by a pair of braced struts (Figs. 1 and 2).

The narrow unbalanced ailerons cover the whole wing span and are rigidly controlled by two rods. Furthermore, a special wheel enables the pilot to lower the ailerons during flight. This increases the camber and consequently the lift, thus appre-

*From Les Ailes, October 20, 1927.

ciably reducing the landing speed.

The wings are of mixed construction. The two spars are openwork rectangular tubes. The ribs are wood and the covering is fabric back of the front spar. The leading edge is covered with plywood. The ailerons have a duralumin framework (Fig. 4).

The fuselage.-is constructed of wood in the usual way, excepting the first two bays, which are metal (Fig. 3). Its framework is braced by piano wires. Back of the pilot's cockpit it is covered with fabric. The front part is covered with ribbed duralumin. The pilot's cockpit is well behind the wings. It is large enough for the pilot to move about easily with his parachute on. The seat and the rudder bar are adjustable.

The airplane is equipped with two Vickers machine guns firing through the propeller. Receptacles are provided for 500 cartridges. An O.P.L. collinator serves as a sight for the pilot.

The horizontal empennage comprises a stabilizer, which can be adjusted during flight by means of a wheel, and a two-part unbalanced elevator. The vertical empennage consists of a fin and an unbalanced rudder. All the tail planes are constructed of duralumin and covered with fabric. The stabilizer is braced by a strut below and a streamlined wire above.

The power plant forms a complete block, which can be easily and quickly removed. This block comprises the engine bed

and a 400 HP. Hispano-Suiza engine with all its accessories. It is attached by four bolts to the framework of the fuselage.

The fuel tank is conical and can be dropped during flight. It is located in front of the pilot's seat, from which it is separated, as likewise from the engine, by a fire wall. These walls consist of two sheets of metal enclosing a sheet of asbestos. The fuel tank has a capacity of 210 liters (55.5 gallons); the oil tank, 20 liters (5.28 gallons). The fuel is delivered to the engine by two disconnectable A.M. pumps.

The cooling is effected by a frontal radiator of the Morane-Saulnier honeycomb type, provided with regulating shutters.

A fire extinguisher completes the precautions against fire (fire walls, removable fuel tank, etc.).

The landing gear has a track gauge of 1.957 m (6.42 ft.). It is of the M.-S. type with two independent half-axles. Its struts are attached to the lower longerons of the fuselage by special pivoting joints. This device removes the danger of breaking one of the longerons in case one of the struts should buckle in a hard landing.

The shock absorbers are situated in the plane of the lateral Vee struts. They consist of a certain number of independent rubber loops, which can be easily replaced. The whole is completely enclosed in the covering of the front struts.

The orientable tail skid can be controlled by the pilot,

in order to facilitate maneuvering on the ground. It is independent of the rudder. It is attached to the fuselage by two bolts.

Characteristics

Span	9.80	m	(32.15 ft.)
Length	6.71	"	(22.01 ")
Height	2.88	"	(9.45 ")
Wing chord	1.70	"	(5.58 ")
Wing area	16	m^2	(172.22 sq.ft.)
Engine power	400	HP	(395 HP.)
Weight, empty	994	kg	(2191 lb.)
Fuel load	155	"	(342 ")
Useful "	105	"	(231 ")
Full "	1254	"	(2764 ")
Wing loading	78.30	kg/m^2	(16.04 lb./sq.ft.)
Power "	3.13	kg/HP	(6.8 lb./HP.)
Power per unit area	25	kg/m^2	(5.12 lb./sq.ft.)

Performances

Maximum speed near ground	256.3 km/h (159.3 mi./hr.)
Climb to 1000 m (3281 ft.)	1 min. 56 sec.
" " 2000 " (6562 ")	3 " 53 "
" " 3000 " (9843 ")	6 " 31 "

Performances (Cont.)

Climb to	4000 m	(13123 ft.)	9	min.	22	sec.
" "	5000 "	(16404 ")	12	"	51	"
" "	6000 "	(19685 ")	17	"	50	"
" "	7000 "	(22966 ")	25	"	37	"
" "	7730 "	(25361 ")	42	"	35	"
Ceiling		8150 m (26739 ft.)				
Safety factor		14				

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

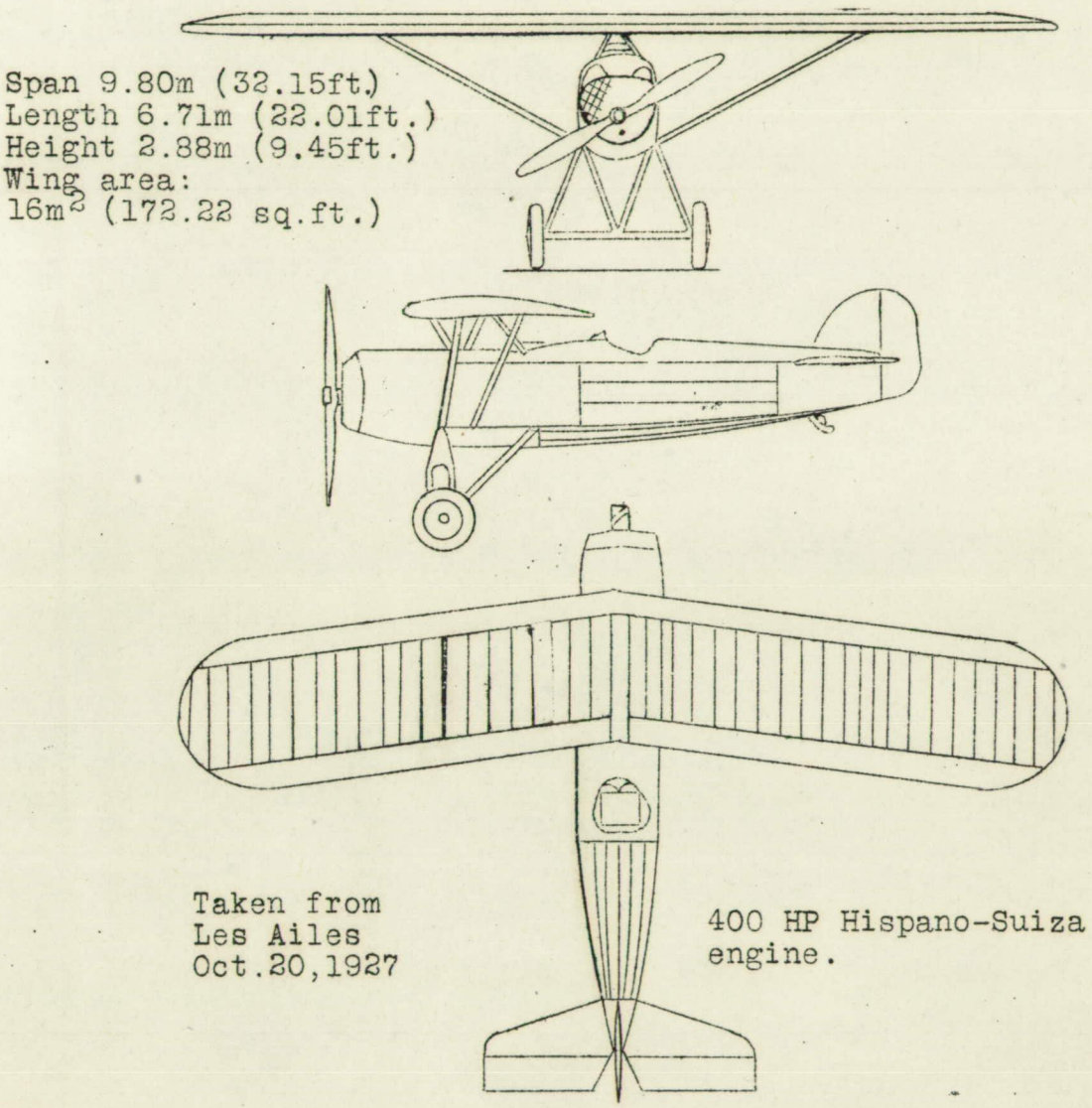

Fig.1 The Morane-Saulnier 121 pursuit airplane.

Fig.2 Morane-Saulnier 121 pursuit airplane. So-called "Jockey" class.

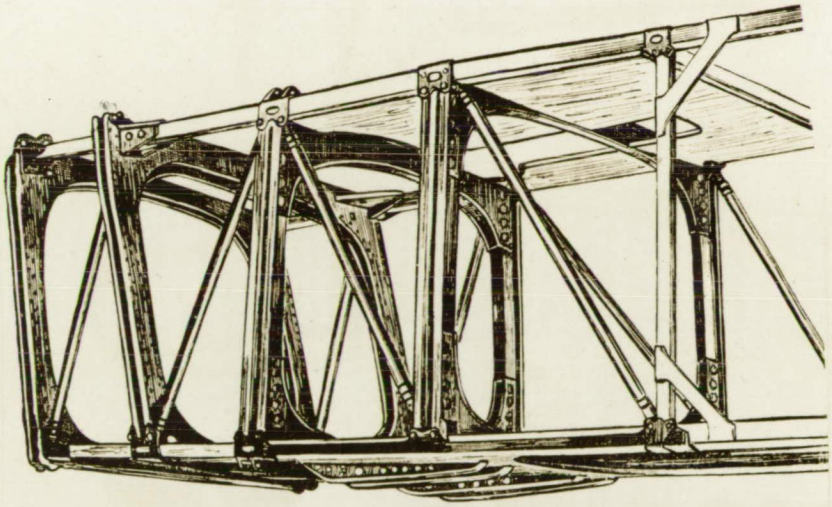

Fig.3 Structural details of front portion of fuselage, which supports the removable engine bed

From L'Aéronautique Mar. 1928.

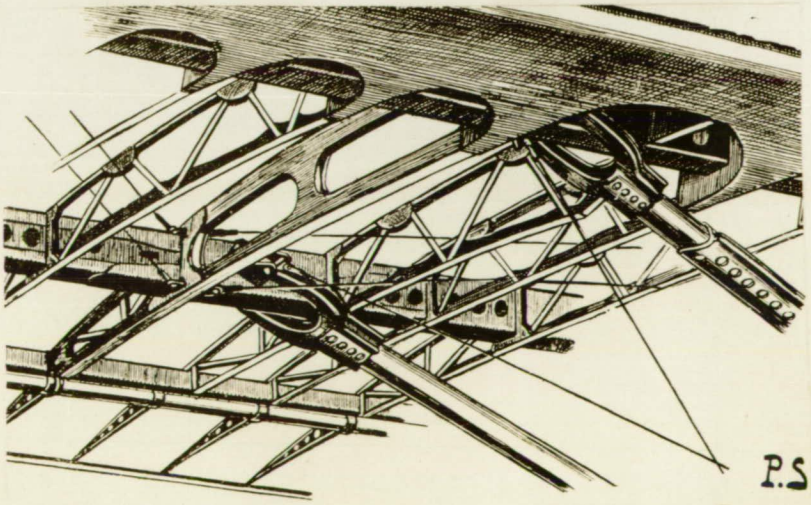

Fig.4 Special pivoting joints attaching struts to reinforced portions of wing spars. 1286 A.S.