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AIRCRAFT CIRCULARS
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No. 106

THE MORANE SAULNIER 223 AIRPLANE (FRENCH)

A Single-Seat Pursuit Monoplane

By André Frachet

From Les Ailes, June 6, 1929

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A Single-Seat Pursuit Monoplane.

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The Morane Saulnier 222 has a two-part braced wing mounted on a triangular cabane. Each half of the wing is joined to the fuselage by a pair of oblique struts. (Figs. 1 and 2).

The wing has a profile of medium thickness, uniform throughout almost the entire span. It has no dihedral angle, but a very decided sweepback.

The ailerons have a chord of 25 cm (9.84 in.) and extend throughout the trailing edge. They are provided with differential controls which enable their simultaneous operation.

The wings are of mixed construction: duralumin spars, wood ribs, and fabric covering. The leading edge is strengthened by a covering of plywood.

The fuselage is constructed of wood and metal. The first two sections are metal. Back of these, it constitutes a normal girder with longerons, cross-pieces and uprights of wood, braced by piano wires. This framework supports light strips of wood which form the streamlining. The engine and the front sections of the fuselage are covered with sheet duralumin. The rest of the fuselage is covered with fabric.

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The pilot's cockpit is behind the wing and affords every facility for using a parachute in case of need. The visibility is excellent in all directions. The seat and rudder bar can be adapted to the pilot.

The Morane Saulnier 222 is equipped with two Darne or Vickers machine guns firing through the propeller. They are mounted to the right of the longitudinal axis of the airplane. Receptacles are provided for 700 cartridges. An O.P.L. collimator, mounted in front of the pilot, enables the latter to aim correctly.

The tail surfaces, like the ailerons, have duralumin frames covered with fabric. The stabilizer can be adjusted in flight by means of a wheel within reach of the pilot. To it are hinged the two unbalanced parts of the elevator. The rudder is likewise unbalanced and is hinged to the after edge of the fin. The elevator and rudder are controlled by means of cables and tubular rods. The stabilizer is braced below by cables on each side of the fuselage and above by cables similarly situated.

The Morane Saulnier 222 is equipped with a 600 hp Gnome - Rhone "Jupiter" VII engine, provided with a rotary compressor. The two-bladed wooden propeller has a diameter of 2.85 m (9.35 feet). The hub is cowled with a spinner which matches perfectly with the metal engine cowling.

The fuel is delivered directly to the carburetor by disconnectable A.M. pumps operated by the engine. The 265-liter (70-

gallon) tank is inside the fuselage, in front of the pilot's cockpit. The tank, which can be dumped during flight, is separated from the engine by a fire wall. The latter consists of a sheet of asbestos between two sheets of aluminum..

The 31-liter (8.19-gallon) oil tank is also inside the fuselage, between the engine and the fuel tank. On leaving the engine the oil is cooled by a radiator located at the right of the cowling.

The precautions against fire include a fire alarm which informs the pilot of any abnormal elevation of the temperature. The pilot can then use the extinguisher, which has pipes terminating in the vicinity of the carburetor and engine.

The landing gear of the Morane Saulnier has a track gauge of 1.957 m (6.42 ft.). It comprises two short articulated axles. Its struts are attached by universal joints to the lower longerons of the fuselage, the rigidity of the whole being maintained by a central V strut.

The shock absorbers are located in the outer struts. Each consists of several loops of elastic cable (sandows) independent of one another and therefore easily replaceable. Each shock absorber is protected from the sun and rain by a streamlined casing.

The orientable tail skid is operated by the pilot simultaneously with the rudder, which greatly facilitates ground maneuvers. It can be removed easily, since it is attached to the

fuselage simply by two bolts.

Characteristics

Span	9.80 m	32.15 ft.
Length	6.50 "	21.33 "
Height	2.98 "	9.78 "
Wing chord	1.70 "	5.58 "
Wing area	16 m ²	172.22 sq.ft.
Weight empty, equipped	947 kg	2088 lb.
Fuel load	203 "	448 "
Full load	1255 "	2767 "
Wing loading	78.5 kg/m ²	16.08 lb./sq.ft.
Power "	2.1 kg/hp	4.61 lb./hp
Power per unit area	37.5 hp/m ²	3.50 hp/sq.ft.

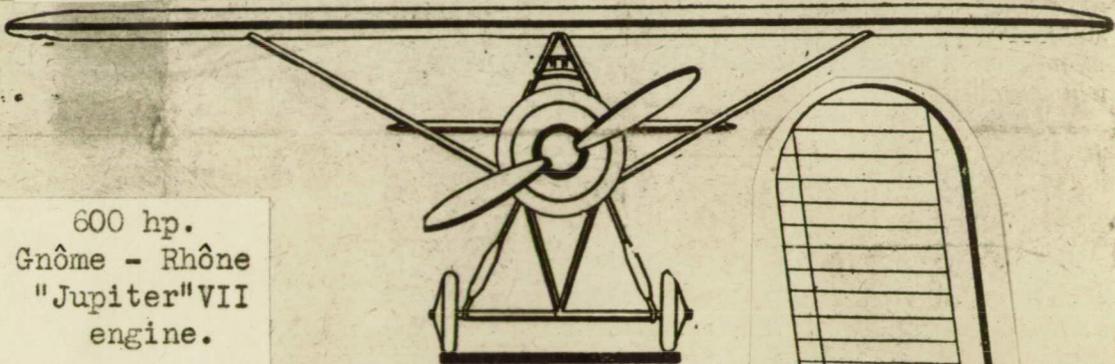
Performances

Speed at 4000 m (13,123 ft.)	about 265 km/h (164.7 mi./hr.)
Climb to 7000 " (22,966 ")	12 minutes
" " 8200 " (26,903 ")	20 "
Theoretical ceiling	12,000 m (39,370 ft.)
Flight duration	5 hours

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



Fig. 1 Three-quarter front view of the Morane-Saulnier 222



600 hp.
Gnome - Rhône
"Jupiter" VII
engine.

Span 9.80m
32.15 ft.
Length 6.50m
21.33 ft.
Height 2.98m
9.78 ft.
Wing area $16m^2$
172.22 sq.ft.

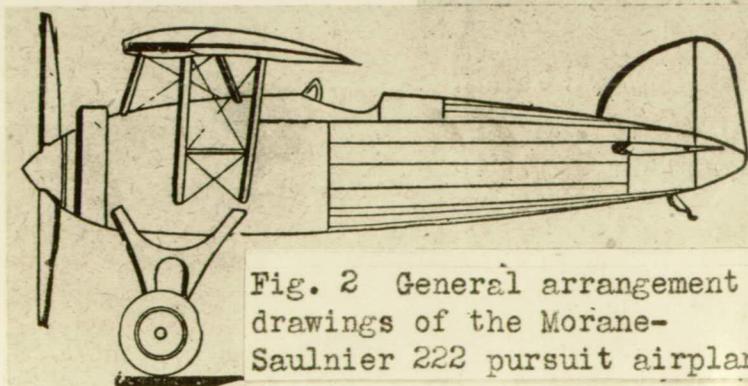
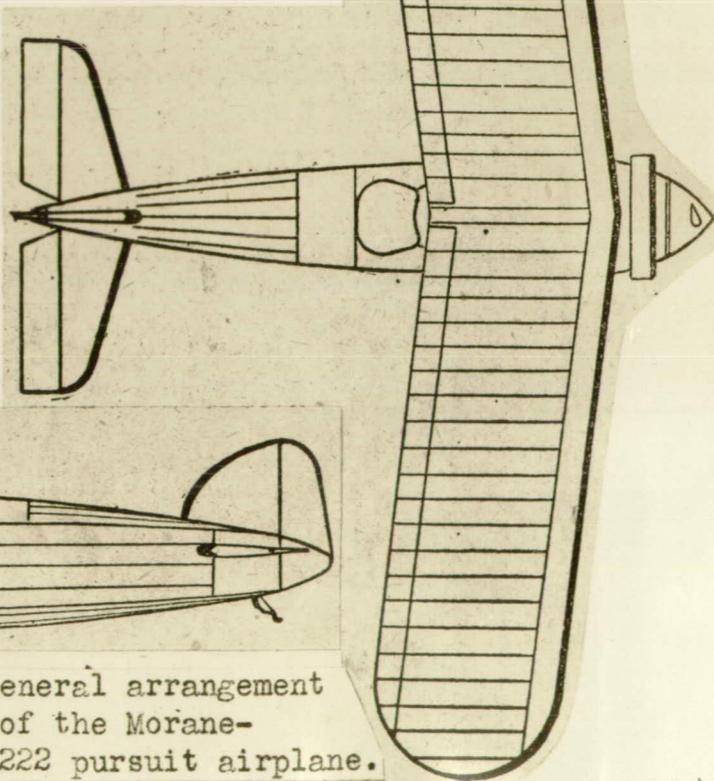


Fig. 2 General arrangement drawings of the Morane-Saulnier 222 pursuit airplane.