

AIRCRAFT CIRCULARS  
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

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No. 115

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THE FARMAN "F.300" COMMERCIAL AIRPLANE (FRENCH)  
A High-Wing Semicantilever Monoplane

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THE FARMAN "F.300" COMMERCIAL AIRPLANE (FRENCH).\*

A High-Wing Semicantilever Monoplane.

The "F.300" airplane which, in its general form (Figs. 1, 2, 3), recalls the "F.190", famed for its Paris-Saigon, Paris-Madagascar, and Paris-Chad flights, and now in use on most of the French and foreign air lines, is moreover an extrapolation. It is a semicantilever monoplane made of wood, duralumin and fabric. The two wings are attached to the upper part of the fuselage and are supported in the vicinity of the lateral engine nacelles by two oblique streamlined duralumin struts attached to the lower part of the fuselage. Their rigidity is assured by auxiliary struts and the landing-gear struts. The landing gear is hinged to the fuselage and to the wing struts and is of the axleless type (Fig. 4). It has a wide track gauge of 3.275 m (10.74 ft.) and is provided with Meissier oleo-pneumatic shock absorbers. The tires are 1000 x 225 mm (39.37 x 8.86 in.), and the wheels are provided with extremely efficient Meissier brakes. The fuselage has a rigid framework with a double covering of plywood reinforced by interior ribs.

The three engines are arranged as follows: one in the front end of the fuselage and the others in lateral nacelles

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\*Translation of a description received from the Paris Office, N.A.C.A. See also L'Aeronautique, February, 1930.

bolted to the under side of the wing (Figs. 5 and 6). This arrangement reduces the drag considerably. Moreover, the three engine propeller groups are placed as near together as possible, in order to facilitate the control of the airplane with either of the lateral engines stopped.

### E q u i p m e n t

The passenger cabin is separated from the pilot room by a partition with a door. It contains eight comfortable wood chairs upholstered with imitation leather and provided with extensible backs and small movable tables. The chairs are also provided with arm rests and straps. Eight large adjustable glass windows provide good visibility and ventilation at the will of each passenger. The windows are provided with adjustable sunshades. Baggage nets enable the passengers to keep necessary articles within reach. A hot-air heating system enables, by a suitable adjustment, the maintenance of any desired temperature in the cabin. At the back of the passenger cabin there is a toilet room with running water, mirror, etc. A large baggage room with a large door enables the carrying of baggage and freight. Electric ceiling lamps, supplied by a current generator, illuminate the cabin during night flights.

The pilot room has windows on the sides and top, thus providing perfect visibility over a very wide range. The side windows can be opened and closed at the will of the pilots. The

inclination of the windows has been specially designed to prevent rain from adhering and obscuring the vision. The controls are dual and can be operated alternately by the two pilots.

The pilot room is separated from the passenger cabin by a door.

The airplane has regulation position lights and can be provided, for night flying, with searchlights, signal lamps, flares, Holt rockets, etc. The electric current is produced by a windmill generator or a floating battery. The airplane is equipped with radio apparatus for both sending and receiving.

The installation of the engine and steering controls received special attention and represent a maximum of convenience and efficiency. They comprise (in addition to the gas and air sectors, fuel cocks, switches, etc.) the air-speed indicator, compass, clock, luminous revolution counter, altimeter, oil thermometers, fuel gauges, etc. Fire extinguishers are mounted on the engines, and the warning signals are placed directly under the eyes of the pilot. A hand extinguisher is placed in the passenger cabin. The engines are started with Farman combination starters, cartridge starters, or any other system desired.

Its simplicity of construction enables inspection and repairs in the minimum time and at the minimum cost. While giving it great strength and excellent aerodynamic properties, it was sought to avoid complicated devices which might put the airplane out of commission for considerable periods of time for their repair or replacement, or which would require a special and elab-

orate set of tools. Great care was taken to render the various parts of the airplane and engines perfectly accessible by suitably located inspection ports, so that slight repairs could be made on the airplane itself.

As regards safety, the full load was calculated so that the simultaneous use of all three engines gives the airplane an advantageous reserve power. Hence, in order to attain a good commercial speed, the three engines need to be operated only at a reduced power, with consequent economy of fuel, less wear and considerably less risk of failure. On the other hand, in case of failure of one of the engines, the other two engines suffice to insure normal flight indefinitely without stalling the airplane and without pushing the engines too much.

One of the most important improvements as regards safety, is the axleless landing gear with its wide track gauge, long-stroke oleo-pneumatic shock absorbers, which gives the airplane, during its take-off or landing run, perfect stability and a minimum of shocks, even on bad ground. Moreover, the wheels are provided with brakes which shorten the landing run in the ratio of 3 : 1, thus enabling the airplane to land on very rough and restricted fields. The take-off runs can likewise be shortened by starting the engines with the wheels braked and then gradually releasing them.

Everything connected with fire prevention (fire walls, extinguishers, removal of fuel tanks from the vicinity of the en-

gines and other sources of fire, etc.) received special attention. It is obvious, moreover, that the operation of the engines far below their maximum speed avoids, in large measure, the danger of breaks and of overheating, which are frequent causes of fire.

The cabin is large, being 2.5 m (about 8 ft.) high by 1.37 m (4.5 ft.) wide, rendering it possible to move freely from one end of the cabin to the other and to make use of the toilet facilities at the back of the cabin.

The easy chairs with wide extensible backs prevent fatigue on long flights, and the large windows furnish a good view of the landscape. Moreover, there is no wing nor superstructure to obstruct the view.

The heat can be adjusted to the desired temperature and the ventilation is perfectly provided for. The tightness of the engines and the distance of the engine nacelles prevent the introduction of any of the exhaust gases or oil vapors. Furthermore, each engine is provided with a particularly effective muffler. The structure of the fuselage renders it largely proof against noises and vibrations. Due to the small wing loading and the balance of this airplane, the motions of rolling and pitching, so liable to cause seasickness, are greatly diminished.

The general characteristics of the "F.300" are:

Span	19.085 m	62.61 ft.
Length	13.350 "	43.80 "
Height	3.200 "	10.50 "
Wing area	66 m <sup>2</sup>	710.42 sq.ft.
Engine power (230 x 3)	690 hp	681 hp
Wing loading	63 kg/m <sup>2</sup>	12.9 lb./sq.ft.
Power loading with 3 engines	6 kg/hp	13 lb./hp
" " " 2 "	9 "	19.57 "
" " " 1 "	18 "	39.14 "

Weight empty (with dual control, wheel brakes, heating system, radio, cabin furnishings, lighting system, toilet accessories, etc.)	2400 kg	5291.0 lb.
Weight of fuel (1050 liters = 277 gal.)	840 "	1851.9 "
and oil ( 85 " = 22.45 gal.)		
Crew (80 x 2)	160 "	352.7 "
Pay load (8 passengers and baggage)	800 "	1763.7 "
Full load	4200 "	9259.3 "

### P e r f o r m a n c e s

With full load, maximum speed near ground according to engine used (Titan, Salmson, Hispano, Lorraine, Farman, etc.)  
210-230 km (130-143 mi./hr.)

Climb to 1000 m (3280 ft.) in 6 minutes

Ceiling 5000 m (16400 ft.)

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

Span 19.08 m (62.61 ft.)  
 Length 13.35 m (43.80 ft.)  
 Height 3.20 m (10.50 ft.)  
 Wing: 66 m<sup>2</sup> (710.42 sq.ft.)  
 area

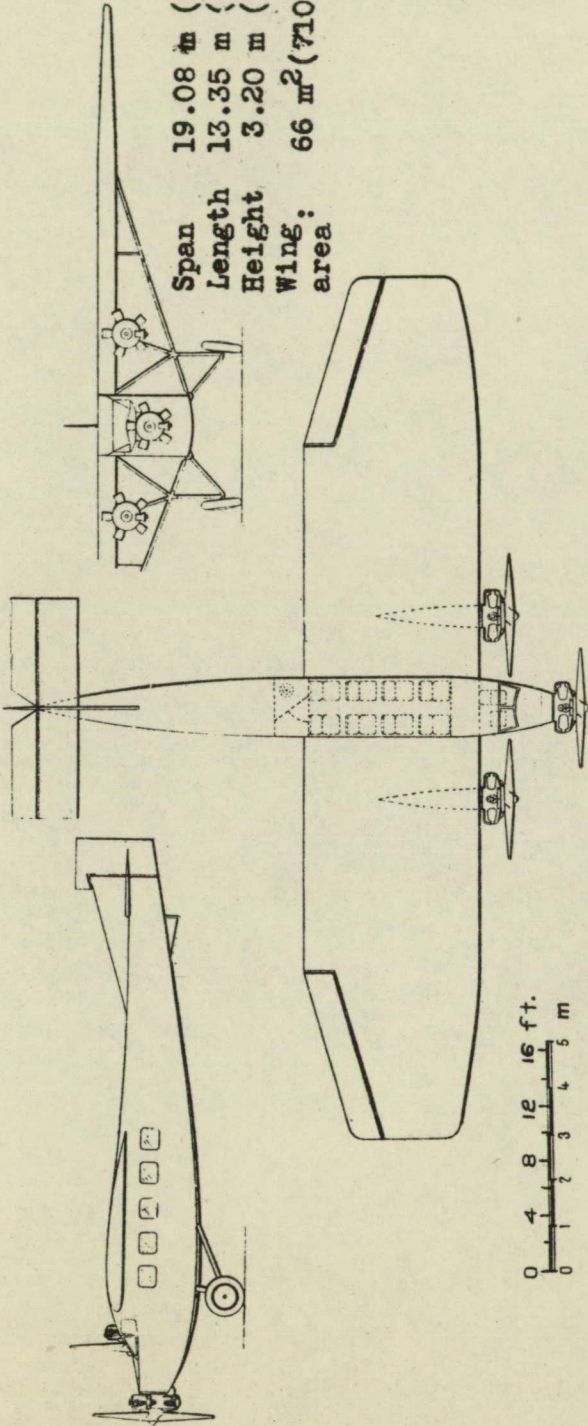


Fig.1 General arrangement drawings of the Farman F-300 commercial airplane.

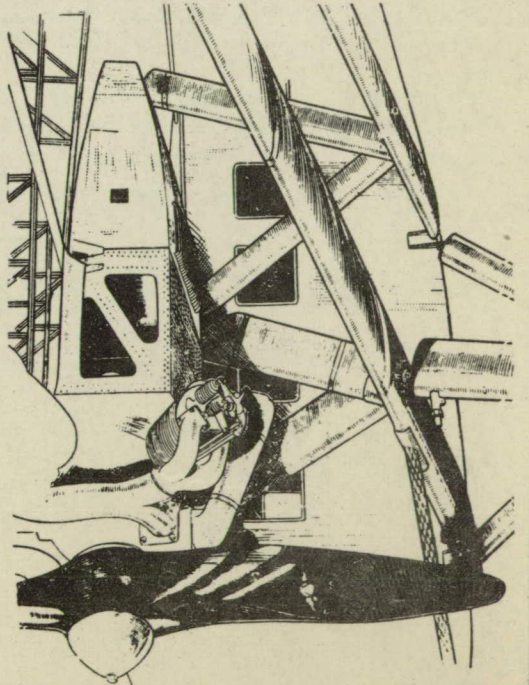


Fig.5 Engine supports under wing.

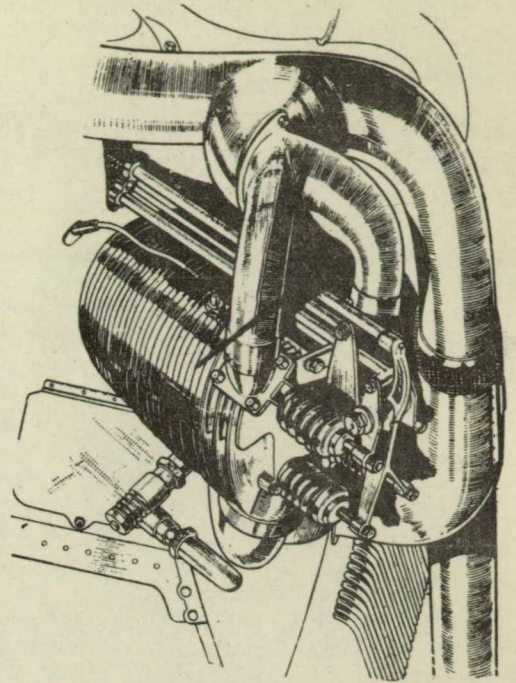


Fig.6 Heated-air intake of central engine.



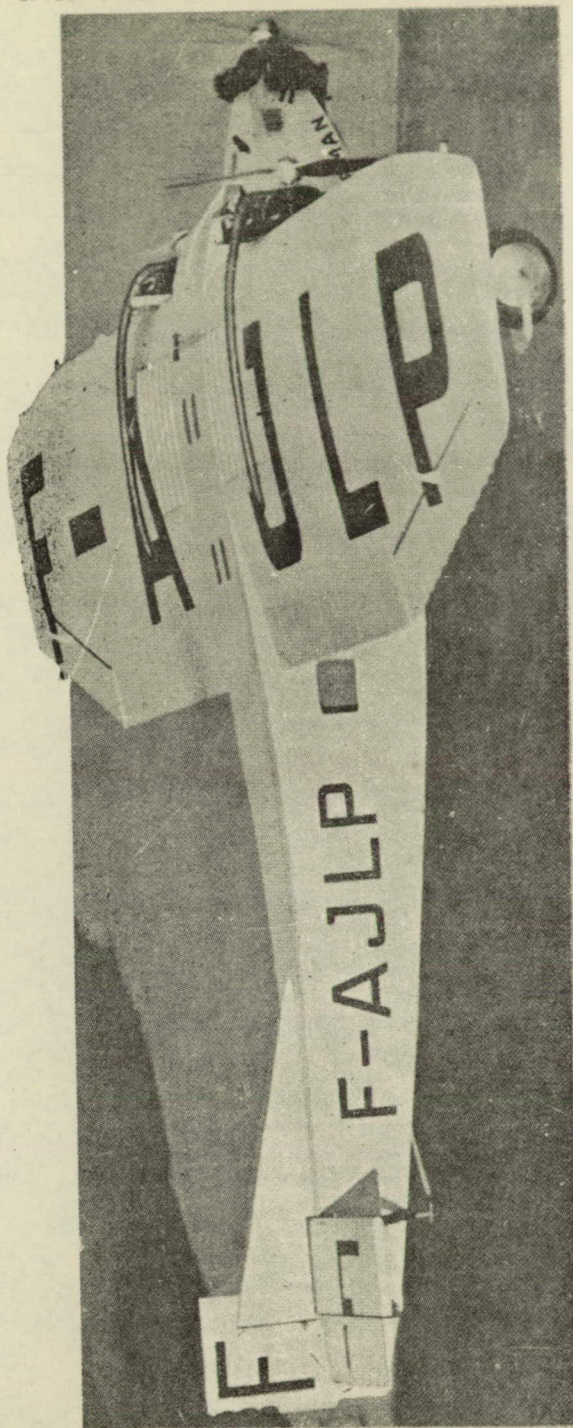


Fig.2 The Farman F-300 in flight with 230 hp Salmson engine.

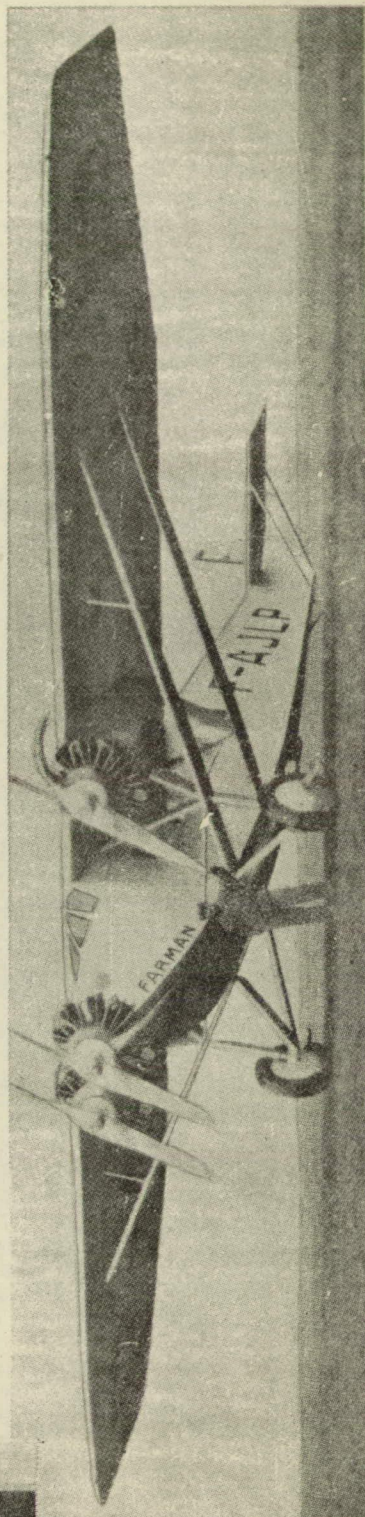


Fig.3 Three-quarter front view of the Farman F-300 airplane.

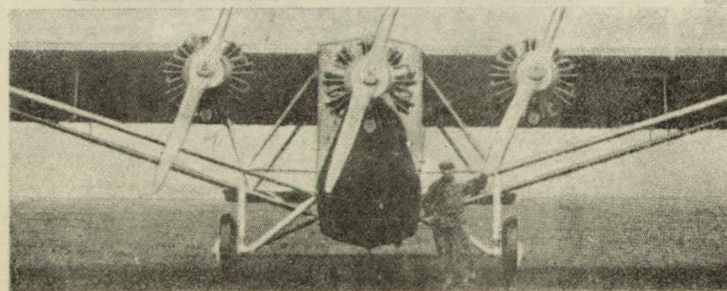


Fig.4 Landing gear of the F-300 airplane. Three 230 hp Salmson engines.