AIRCRAFT CIRCULARS

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 15

THE FARMAN COMMERCIAL AIRPLANE "JABIRU"

Translation from the French

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THE FARMAN COMMERCIAL AIRPLANE "JABIRU." *

The Farman commercial airplane "Jabiru F 3X" was designed to satisfy as completely as possible the requirements of the aerial-navigation companies, which the Aero Club of France had embodied in its rules and regulations for the 1923 commercial airplane contest.

The good functioning of a commercial air line requires airplanes which, while satisfying the usual conditions of strength, of good construction and flight behavior, offer perfect flight reliability, comfort for passengers and good economic efficiency.

Reliability of flight can be obtained only by the employment of a sufficient number of entirely independent power plants. The comfort of the passengers requires roomy cabins separated from the engines. These conditions entail additional structural drag and weight, which must be offset as much as possible on the other parts of the airplane, in order to conserve satisfactory economic efficiency.

For this reason, the Farman airplane "Jabiru" was designed in the form of a large thick-wing monoplane. The thickness of the wing renders it possible to enclose the framework required to withstand the stresses of flight. The monoplane form eliminates, moreover, the wing interference, which impairs the effic-

* From a circular published by the "Société des Avions H. and M. Farman," Billancourt, France.

iency of biplanes.

The lifting surface of this airplane consists of a large wing of 19 m (62.34 ft.) span and 6 m (19.68 ft.) chord at its center. The chord and thickness both decrease toward the wing tips.

The fuselage is under the middle of the wing and has an outside width of 1.6 m (5.25 ft.) and a height of 2 m (6.56 ft.).

The bottom of the fuselage carries a small wing containing a horizontal girder of two spars designed to support the engine nacelles. This wing has a span of 5 m (16.40 ft.).

The spars of the two wings and the struts form two double V girders on each side of the fuselage, the engine nacelles being located in the point of the V.

The landing gear consists of two wheels supported by the usual "sandows," each by a kind of pyramid consisting of a vertical V, placed with its point downward under each engine nacelle and an oblique steel tube connecting the point of the V to the middle of the bottom of the fuselage.

The fuselage contains, from fore to aft: a baggage compartment capable of holding 12 packages 60 x 40 x 15 cm (23.62 x 15.75 x 5.91 in.); above and just in front of the wing, a double seat for the pilot and his assistant; next, the passenger cabin, with minimum inside dimensions of 1.5 m (4.92 ft.) width and 1.8 m (5.91 ft.) height, and room for 12 comfortable seats and a central aisle; at the rear, a large room equipped for aerial

navigation, with all the latest instruments, drift-meter, compass, radio sending and receiving and radiogoniometric instruments, work table and map holder; behind this room, a toilet room.

Access to the fuselage is through a sliding door. Exits are provided at several points and can be used in all positions of the airplane. Special doors enable the assistant pilot to inspect the engines during flight and make slight repairs.

A row of glass windows illuminates the cabin and enables the passengers to view the landscape. Each passenger has an electric heater at his disposal.

The airplane is equipped with everything required for night flight: illumination, searchlights, landing flares, position lights.

Electricity is furnished, for the radio, illumination and heating, by special generators with wind propellers, which can be drawn inside the fuselage when not in use.

The present airplane has four 180 HP. Hispano engines, but can readily be equipped with two Lorraine engines. This modification necessitates no important structural change.

The main tanks are in the wing, far from the engines, thus avoiding all risk of fire.

Two auxiliary tanks can be installed, one in each engine nacelle between the engines. These tanks are completely separated from the engines and communicate only with the main tanks

through the medium of a pump.

Characteristics and Performances

Span	19.00 m	(62.34 ft.)
Length	13.68 "	(44.88 ")
Height	4.48 "	(14.70 ")
Useful wing area	81.00 m^2	(871.88 sq.ft.)
Total wing area	90.00 m^2	(968.75 ")

The present airplane, with four 180 HP. Hispano engines, can climb with one engine stopped. It can fly nearly horizontal with two engines stopped and with an extremely low rate of descent. When equipped with Lorraine engines, it can likewise fly with one engine stopped. Its maneuverability, with or without engines, is excellent and much superior to that of other airplanes of the same weight. It lands with remarkable ease. Its stability during flight is excellent. The steering controls require very little effort.

Fuel consumption.- During the Aero Club Contest, in very unfavorable weather, the airplane, under full load, consumed only 3211 kg (7079 lb.) of gasoline and 129 kg (284.4 lb.) of oil, in flying a distance of 3040 km (1889 miles), with six take-offs and six landings. The fuel consumption of two Lorraine engines would be less for the same flight.

Performances of the Jabiru With Four 180 HP. Hispano Engines.

The performances of this airplane at Villacoublay before the "Service Technique Francais" were as follows:

Speed near the ground	209 km/h	(130 mi./hr.)
" at 1000 m (3281 ft.)	206 "	(128 ")
" " 2000 " (6562 ")	201 "	(125 ")
" " 3000 " (9842 ")	192 "	(119 ")
Climb to 1000 " (3281 ")	in 6 min. 16 sec.	
" " 2000 " (6562 ")	" 14 " 14 "	
" " 3000 " (9842 ")	" 26 " 11 "	
" " 4000 "(13123 ")	" 37 " 22 "	
Ceiling 4250 "(13944 ").		

These tests were made with full load under the following conditions of weight.

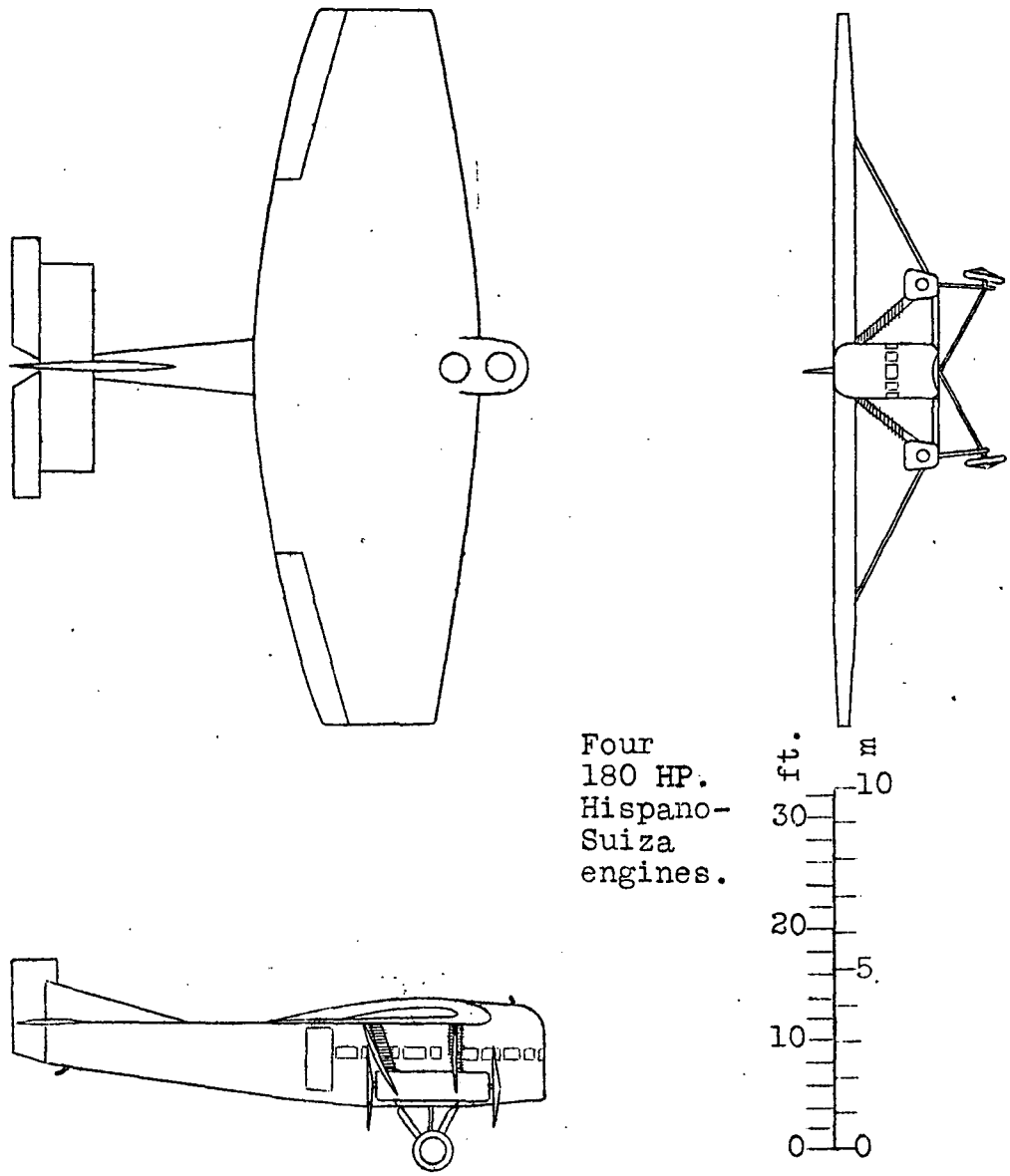
Weight of equipped airplane	3334 kg	(7350.2 lb.)
Radio instruments	120 "	(264.6 ")
Crew, passengers and baggage	1010 "	(2226.6 ")
Gasoline	664 "	(1463.9 ")
Oil	72 "	(158.7 ")
Total	5200 kg	(11464.0 lb.

(The weight equipped included the electric equipment for night flights, illumination and heating cabin fittings, navigation instruments, etc.)

Military Jabiru.- Since the bottom of the fuselage is entirely unobstructed, this airplane can be very easily converted into a bomber or torpedo plane. Its speed and maneuverability render it capable of engaging in aerial combat, in spite of the heavy load of bombs carried. The division of the power among several independent plants gives it perfect flight reliability and even allows its use over the sea.

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

Span 19.7m (64.63ft.)
Length 13.92m(45.67ft.)
Height 4.48m(14.70ft.)
Surface 81m^2 (871.88sq.ft.)



Taken from "The Aeroplane" November 7,1923

Fig.1 The Farman "Jabiru" commercial airplane.

Fig.2 Farman "Jabiru" commercial airplane.

Fig.3 Interior view of cabin.