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AIRCRAFT CIRCULARS

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 77

RENÉ COUZINET MONOPLANE (FRENCH)

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for Aeronautics
Washington, D. C.

Washington
July, 1928

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

AIRCRAFT CIRCULAR NO. 77.

RENÉ COUZINET MONOPLANE (FRENCH).*

By J. Serryer.

This large airplane is one of the best products of aeronautic science up to the present time. In its construction René Couzinet has triumphed over innumerable difficulties of every description. Airplanes of great fineness have both advocates and detractors. It is therefore very important to determine practically the real advantages of airplanes so costly and difficult to make.

This airplane is the product of much thought and ingenuity. The wings support directly the larger part of the load, which, for transatlantic flights, consists chiefly of fuel. Some of the fuel tanks could be replaced by freight.

The union of the fuselage and the immense wing is facilitated by the low position of the latter. Though this arrangement is advantageous from the structural viewpoint, it absorbs a considerable portion of the fuselage at the point where it could be used for passenger accommodations. It would be possible to increase the height of this part enough to render it inhabitable. It should be borne in mind, however, that it was designed for long non-stop flights and all the arrangements were made with this one end in view.

*From Les Ailes, March 29, 1928.

The wing is made in a single piece with a span of 27 m (88.58 ft.) and a maximum chord of 5 m (16.4 ft.). This wing has a maximum thickness of nearly 1 m (3.28 ft.), which diminishes fore and aft from its axis. The plan view shows a trapezoidal shape, the streamlined tips somewhat resembling the wing of the light airplane Dewoitine D-VII.

The long narrow ailerons are hinged to secondary spars parallel to the trailing edge of the wing.

The framework of the wing is made entirely of wood. It consists of two plain-wood box spars of equal size. The main box ribs alternate with intermediate trellis ribs. Parallel to the wing spars there are several wood strips which help to support the plywood wing covering. The latter is protected by several coats of fireproof dope.

The fuselage is of very robust construction and resembles the hull of a seaplane. Its framework consists of a number of main bulkheads and secondary bulkheads joined by wood strips and covered with plywood. Bulkheads directly over the wing spars support the fittings which secure the fuselage to the wing. Toward the rear the fuselage tapers, like the body of a whale, to a vertical edge which supports the rudder.

*Near the front end are the seats for the pilot and mechanic. A small door in front of the mechanic's seat affords access

*This paragraph was taken from the March 22, (1928) number of Les Ailes.

to the central engine. Under the pilot's seat a manhole opens into the wing and affords access through a 0.7 m (2.3 ft.) corridor to the lateral engines. Behind the pilot's seat there is a room containing two couches. Behind this room there is a spacious cabin for the radio operator and the navigator. Behind this cabin a central walkway, extending clear to the tail, affords easy access to all the steering controls, pipe connections, fuel cocks, etc.

An opening in the fuselage receives the horizontal stabilizer to which the two sections of the elevator are hinged. All the tail planes are made of wood and covered with plywood. A special compensating device was designed by Couzinet. It somewhat resembles the one used on the Bleriot 165 airplane.

The engine-propeller groups, three in number, have each a 180 HP. Hispano-Suiza engine, capable of developing 230 HP. They actuate, by direct drive, Chauvière two-bladed wood propellers of 2.6 m (8.53 ft.) diameter. The water and oil are cooled by Lamblin radiators.

The fuel tanks are inside the wing. There are seven of them with a total capacity of 6200 liters (1637 gallons). The oil tanks have a capacity of 280 liters (74 gallons). A compressed-air device enables the pilot to empty the tanks in 55 seconds.

The landing gear has two independent wheels, each being mounted in a housing directly under one of the side engines.

The track gauge is 5.4 m (17.7 ft.). The shock absorber consists of 36 independent loops of rubber cable. Each wheel is enclosed in a cowling which forms a continuation of the cowling of the engine under which it is situated.

General Characteristics

Span	27.00 m	(88.58 ft.)
Length	15.45 "	(50.69 ")
Height	3.90 "	(12.80 ")
Maximum chord	5.00 "	(16.40 ")
Wing area	92.75 m²	(998.35 sq.ft.)
Power plant:	three 180 HP. Hispano-Suiza engines	
Weight, empty	3900 kg	(8598 lb.)
Useful load	5100 "	(11244 ")
Full load	9000 "	(19842 ")
Wing loading	97 kg/m²	(19.87 lb./sq.ft.)
Power "	13 kg/HP	(28.66 lb./HP.)
Power per unit area	6 HP/m²	(.54 HP./sq.ft.)

Theoretical Performances

Speed	180-230 km/h	(112-143 mi./hr.)
Fineness in flight	4.7	

T e s t s*

The three-engined Couzinet monoplane "Arc-en-ciel" described in our April number, made its first flight May 7, at Orly, under the pilotage of Mr. Drouhin. Mr. Couzinet (its designer) was aboard, as also Mr. Gianoli, who had an important part in its construction at the Letord factory. During the week, the "Arc-en-ciel" made eight flights amounting to five hours with a total weight of 5600 kg (12346 lb.) for an empty weight of 4200 kg (9259 lb.). From this time the maneuverability of the airplane (whose beauty in flight was striking) was perfect and all the controls had been adjusted. The propeller tests are about to be undertaken in order to obtain the maximum output from the three 180-230 HP. Hispano-Suiza engines. At present the airplane climbs readily with two engines (power loading 14 kg/HP) and maintains horizontal flight with only one engine (power loading 28 kg/HP), a result evidently due to its very great fineness (14.8).

The instantaneous and simultaneous starting of the three engines by the Letombe-Luchard method has been much remarked.

The tires are non-derimmable Dunlops 1500 x 300 mm (59.1 x 11.8 in.).

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

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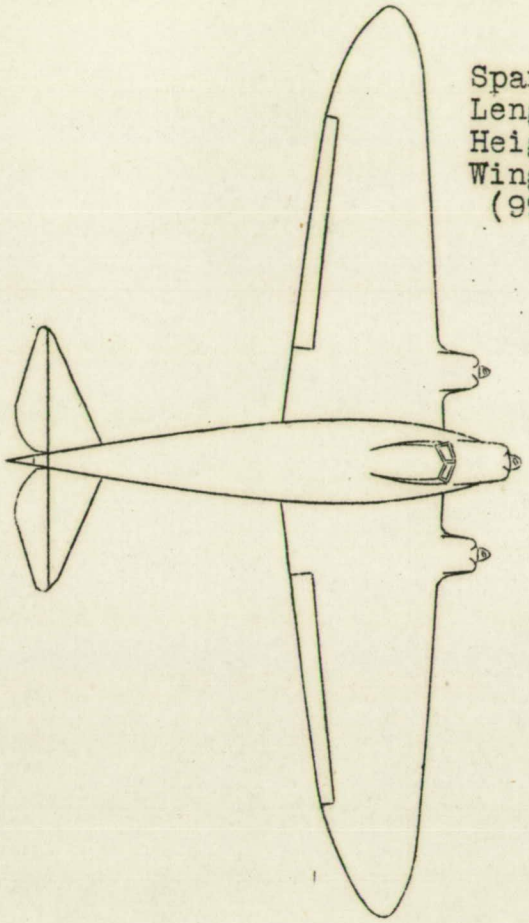
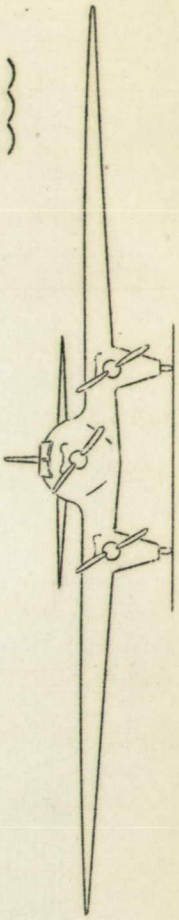
*From L'Aéronautique, May, 1928.



Span 27.00m(88.58 ft.)
Length 15.45m(50.69 ft.)
Height 3.90m(12.80 ft.)
Wing area 92.75m^2
(998.35 sq.ft.)



Three
180 HP.
Hispano-
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engines

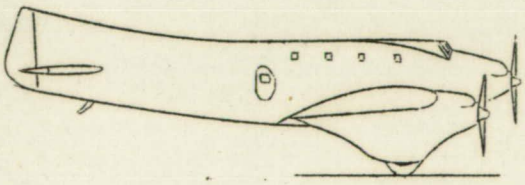

Fig.1 René Couzinet monoplane.

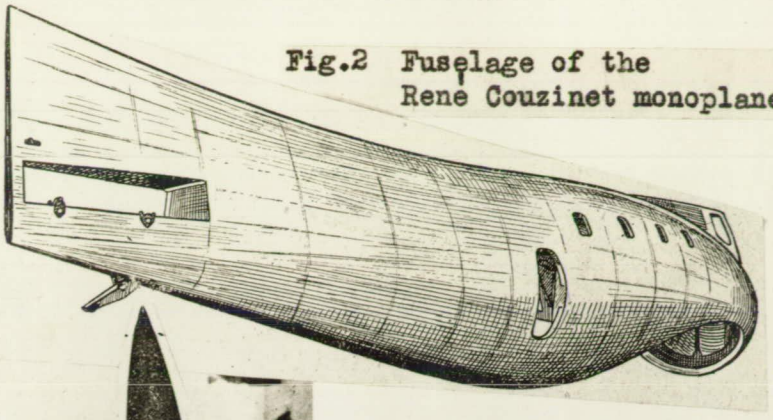

Fig.2 Fuselage of the René Couzinet monoplane

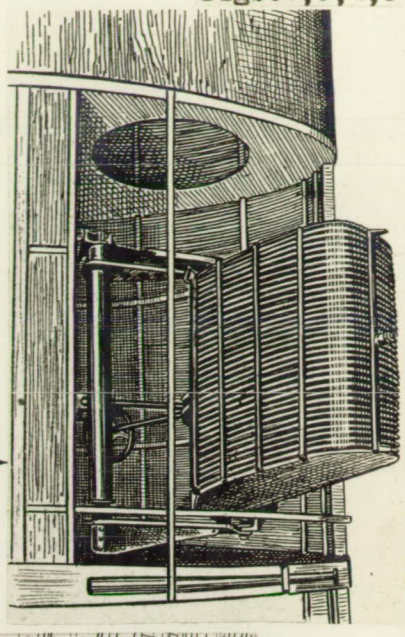

Fig.3 Radiator of right-hand engine before engine is installed.

Three-quarter front view of the René Couzinet airplane

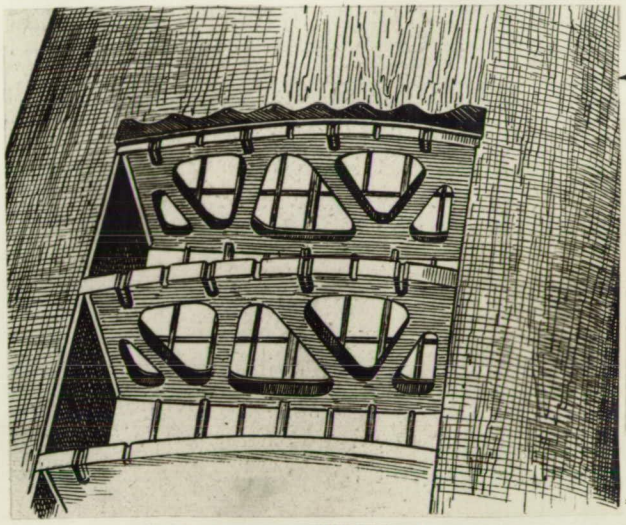

Fig.4 Structure of central part of wing, as seen from above

Taken from L'aéronautique Mar. & Apr. *107&108 1928

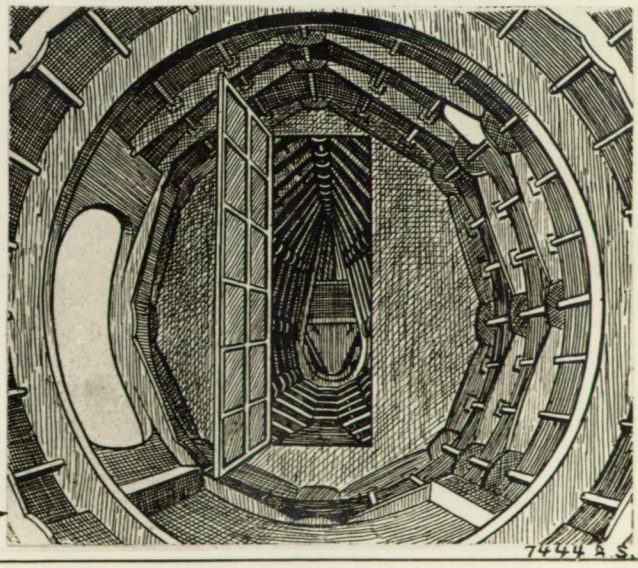

Fig. 5 Interior of fuselage looking aft. The open passage can be used during flight to inspect the steering controls and the tail-skid shock absorbers.

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