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AIRCRAFT CIRCULARS
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 170

THE LATECOÈRE 501 COMMERCIAL SEAPLANE (FRENCH)

A Three-Engine Metal Sesquiplane

Washington
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for Aeronautics
Washington, D. C.

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THE LATÉCOÈRE 501 COMMERCIAL SEAPLANE (FRENCH)*

A Three-Engine Metal Sesquiplane

General characteristics.— The Latécoère 501 commercial seaplane is a three-engine sesquiplane of 1,200 hp with a central hull of metal. The cellule comprises a wing and two planing fins which contain the fuel and insure the transverse stability of the flying boat on the water. (Figs. 1, 2, 3.) The two-step central hull with curved Vee bottom is divided into four water-tight compartments, including the baggage hold, the pilot's station, a cabin for 8 passengers and the mail hold. The shape of the hull was derived from the four-engine 340 and the twin-engine 380.

This flying boat has a metal structure. The hull planing fins and central wing portion are duralumin. The tail surfaces and the wings are fabric covered.

Power plant.— The power plant consists of three Hispano-Suiza 400 hp engines mounted on the wing. The two lateral engines with tractor propellers are mounted in front and the central engine with pusher propeller in the rear. Flight is possible under full load with any one of the engines stopped. Each engine is supported by two tubular struts of L 2R alloy secured to the wing spars. The members of the engine bearers are cross-braced between the two wing spars by L 2R tubes and steel wires. The wing is covered with L 2R sheet near the engine nacelles to allow access to the engines for inspection and repair. Each engine has an individual fuel supply system. The fuel is delivered to all or either of the three engines at will by an auxiliary hand pump. The water is cooled by three Chausson radiators mounted below the engines. The oil tanks are located in the engine nacelles.

Wings.— The wing is of the standard twin-spar type with S.T.Ae. profile 1A, cross-braced in plan by L 2R tubes

*From data furnished by the manufacturers and from L'Aéronautique, August, 1932, pp. 240-241.

and high-tensile steel wires. (Fig. 4.) The L 2R box spars have multiple flanges and lightened webs. The struts are of round faired L 2R tubes.

Planing fins.- These have a symmetrical semithick section. They are attached to the hull and connected with the main wing by struts. The structure of the planing fins consists of two I-section L 2R spars and truss ribs carrying the covering of 5/10 mm (0.02 in.) and 8/10 mm (0.03 in.) L 2R sheet. The stresses of the wing struts are transmitted to the spars by rustproof steel fittings, riveted to two L 2R half casings secured to the spar webs. Each fin forms a fuel tank which is divided by a transverse bulkhead into two compartments, the volumes of which are as 2 to 1 in order to provide individual fuel supply for the engines. Two watertight ports permit internal inspection of each fin.

Hull.- The hull is made entirely of L 2R alloy. (Figs. 5, 6, 7, 8.) It has a very sharp stern and two steps, the forward one for taking off and the rear one for landing. The structure is of the longitudinal type. Continuous I-section stringers transmit the skin stresses to the transverse frames consisting of L 2R webs stiffened by Warren trusses of L 2R half-casings. The hull is divided by watertight bulkheads into four compartments which are, from bow to stern:

a) Control compartment.- It is located in the bow and contains the instruments and controls. Access to the deck is by a trap through which the mechanic may climb out for maneuvers on the water.

The engines are started by a Bristol starter which also drives a radio generator for sending messages when on the water.

The fuel and cooling systems are shown in Figure 9.

b) Pilot's cockpit.- The inclosed cockpit with single control on the left is well lighted. (Fig. 10.) The station for the radio operator and navigator is on the right and contains all the navigation instruments and a radio sending and receiving set. (Fig. 11.)

c) Cabin.- The cabin, with a central passage, is comfortably equipped for 8 passengers. It is ventilated and lighted by 8 large portholes. Access to the cabin is by a door in the deck of the hull and through a passage

which separates the cabin from the lavatory.

d) Mail compartment.-- The mail compartment contains also a bilge pump and tools for the mechanic.

Tail surfaces.-- The tail surfaces are of the braced monoplane type and have a fabric-covered structure. The rudder and elevator are balanced by small metal ailerons adjustable in flight.

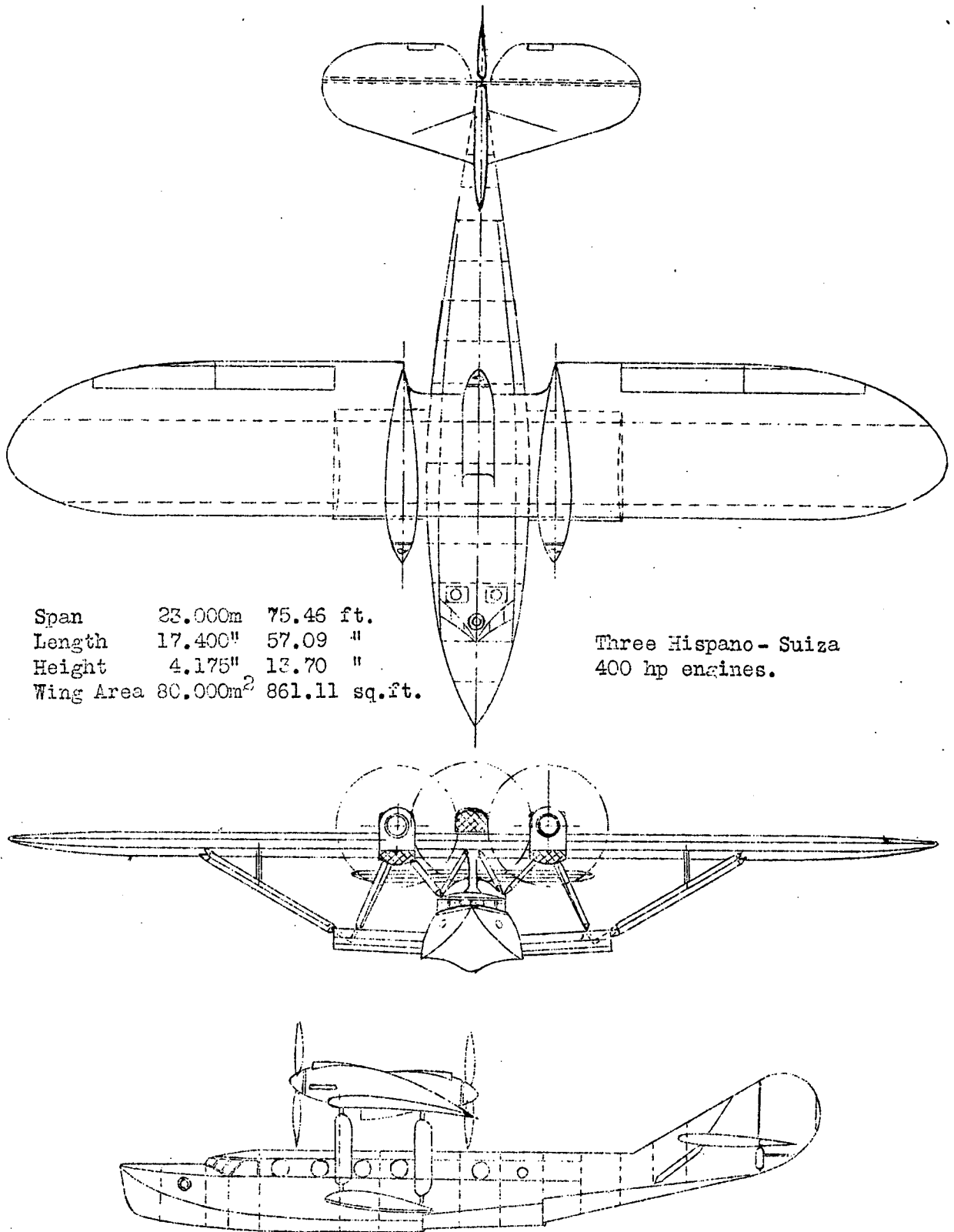
The L 2R spars are tubular. The ribs of the horizontal tail surfaces are of the Warren truss type and those of the vertical surfaces have lightened webs.

CHARACTERISTICS

| | | |
|-------------------------------|--------------------|---------------|
| Span | 23 m | 75.46 ft. |
| Over-all length | 17.4 m | 57.09 " |
| Height (propeller horizontal) | 4.175 " | 13.70 " |
| Wing area | 80 m ² | 861.11 sq.ft. |
| Area of planing fins | 11.9 " | 128.10 " " |
| Wing chord | 3.9 m | 12.80 ft. |
| Area of ailerons | 8.2 m ² | 88.26 sq.ft. |
| Area of horizontal empennage | 14.0 " | 150.69 " " |
| Area of vertical empennage | 5.5 " | 59.20 " " |
| Width of hull at step | 2.5 m | 8.20 ft. |
| Maximum height of hull | 1.93 " | 6.33 " |
| Maximum cross section | 3.8 m ² | 40.90 sq.ft. |

| | | |
|------------------------|----------|--------------|
| Weight empty, equipped | 4,040 kg | 8,906.66 lb. |
| Weight of fuel | 1,270 " | 2,799.87 " |
| Weight of crew (2 men) | 160 " | 352.74 " |
| Pay load | 890 " | 1,962.11 " |
| | <hr/> | <hr/> |
| Total weight | 6,360 " | 14,021.38 " |

Translation by W. L. Kaporindé,
National Advisory Committee
for Aeronautics



Span 23.000m 75.46 ft.
Length 17.400" 57.09 "
Height 4.175" 13.70 "
Wing Area 80.000m² 861.11 sq.ft.

Three Hispano - Suiza
400 hp engines.

Fig. 1 General arrangement drawing of the Latécoère 501 seaplane.

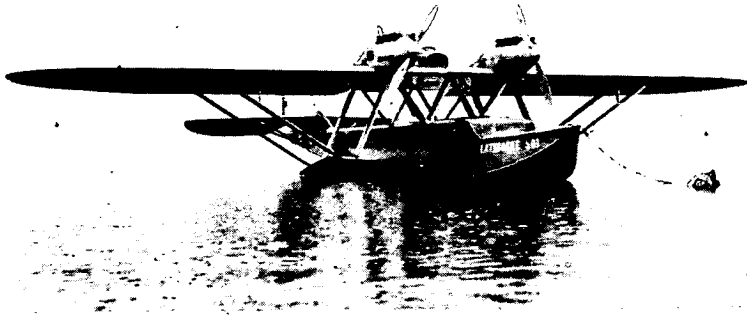


Fig. 2 Three quarter front view of Latécoère 501 seaplane

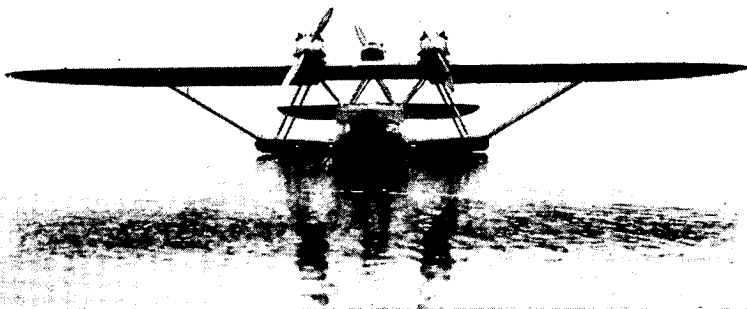


Fig. 3 Front view of the Latécoère 501 seaplane.

Fig. 6 Interior view of the Latécoère 501 seaplane, looking toward the bow.

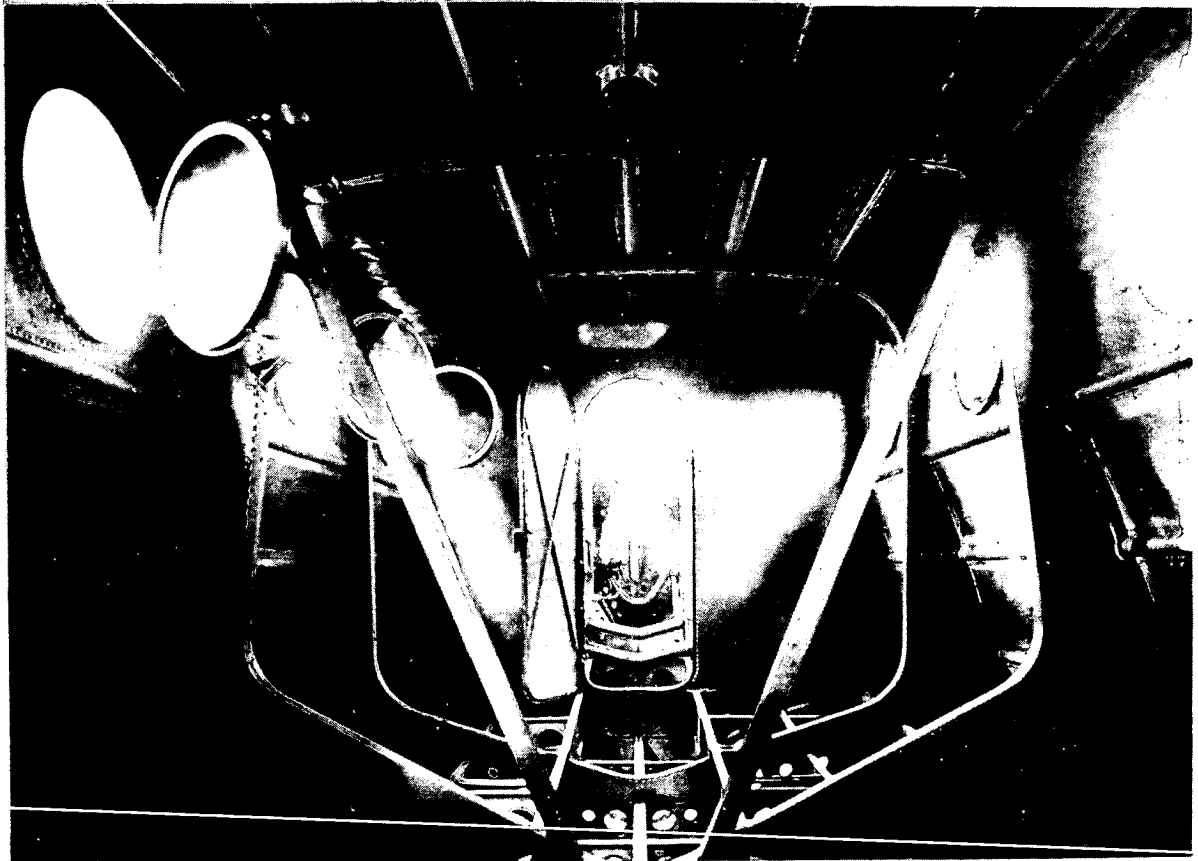
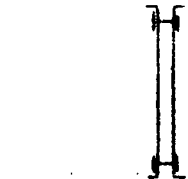
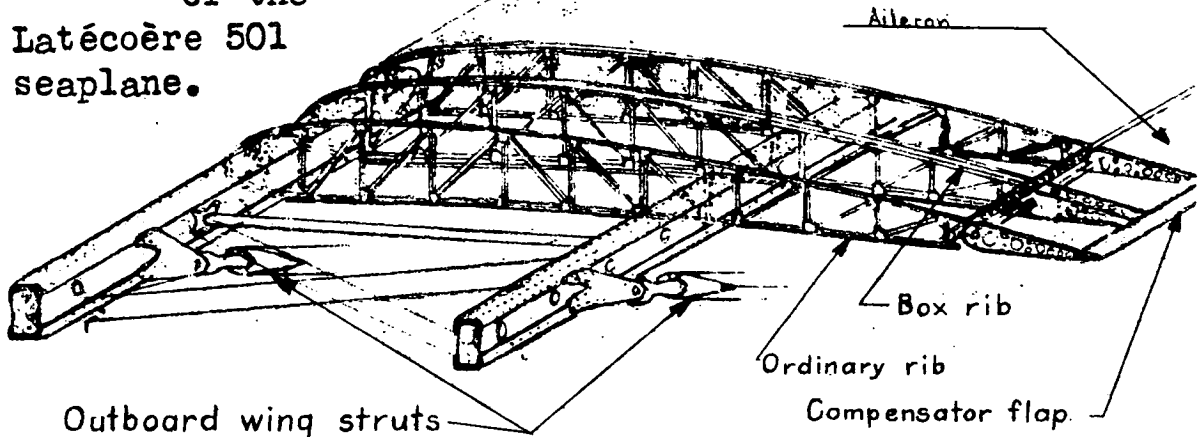


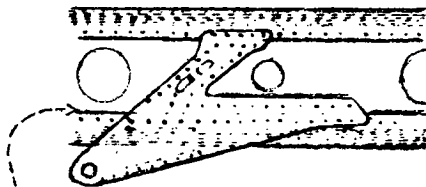
Fig. 4 Wing structure
of the
Latécoère 501
seaplane.



Box rib



Wing spar



Outboard wing
strut fitting

U section and L2R tube

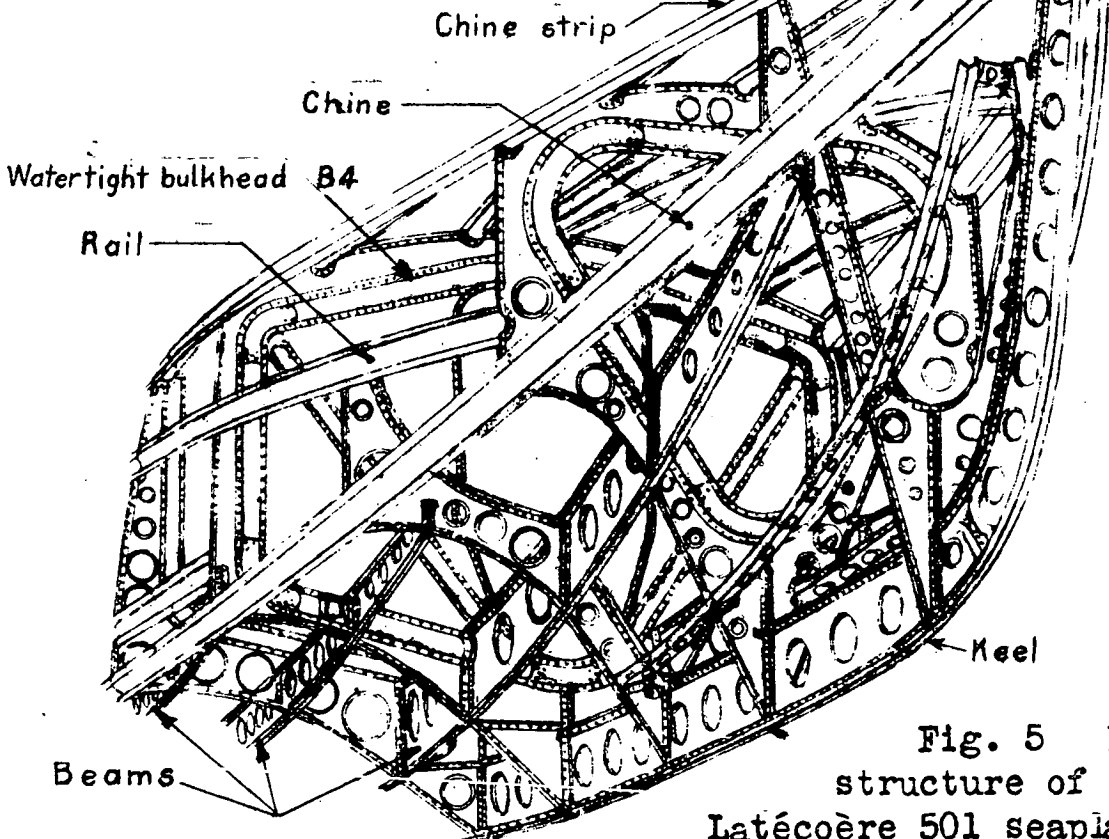


Fig. 5 Bow
structure of the
Latécoère 501 seaplane

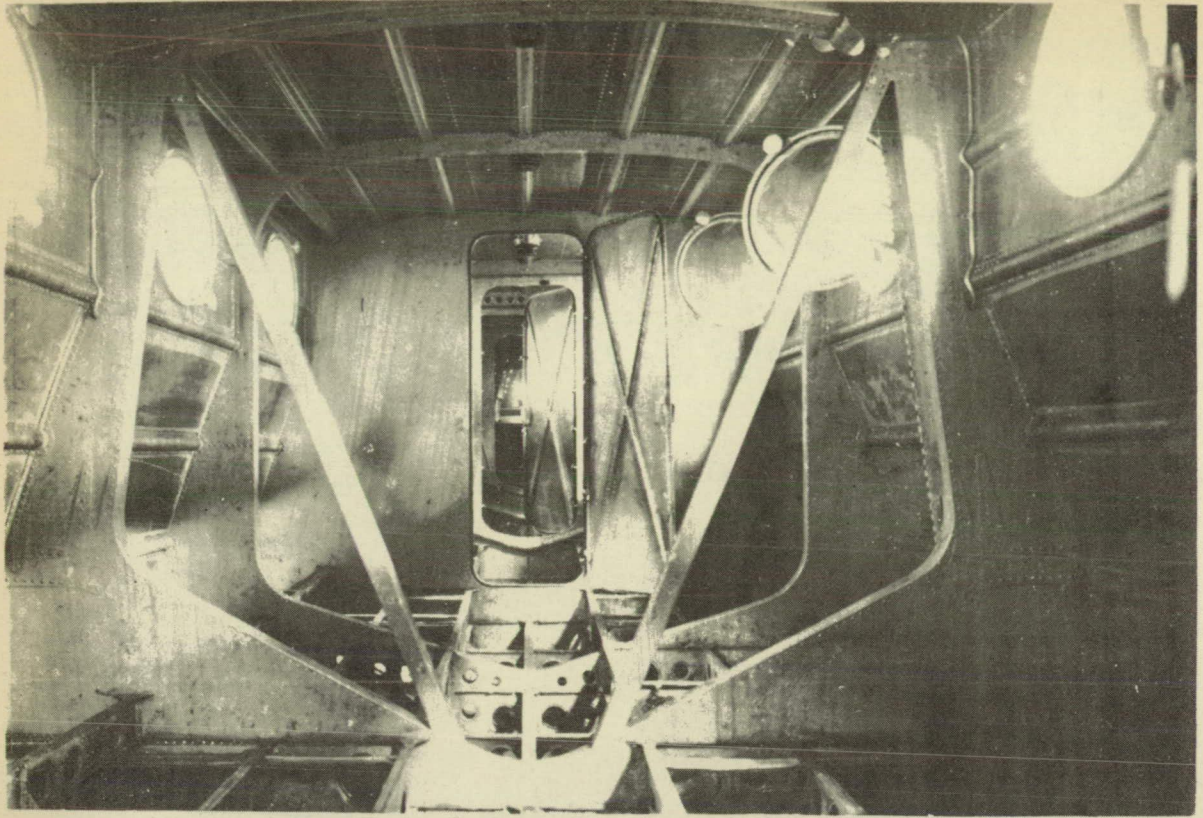


Fig. 7 Interior view of the hull of the Latécoère 501 seaplane.

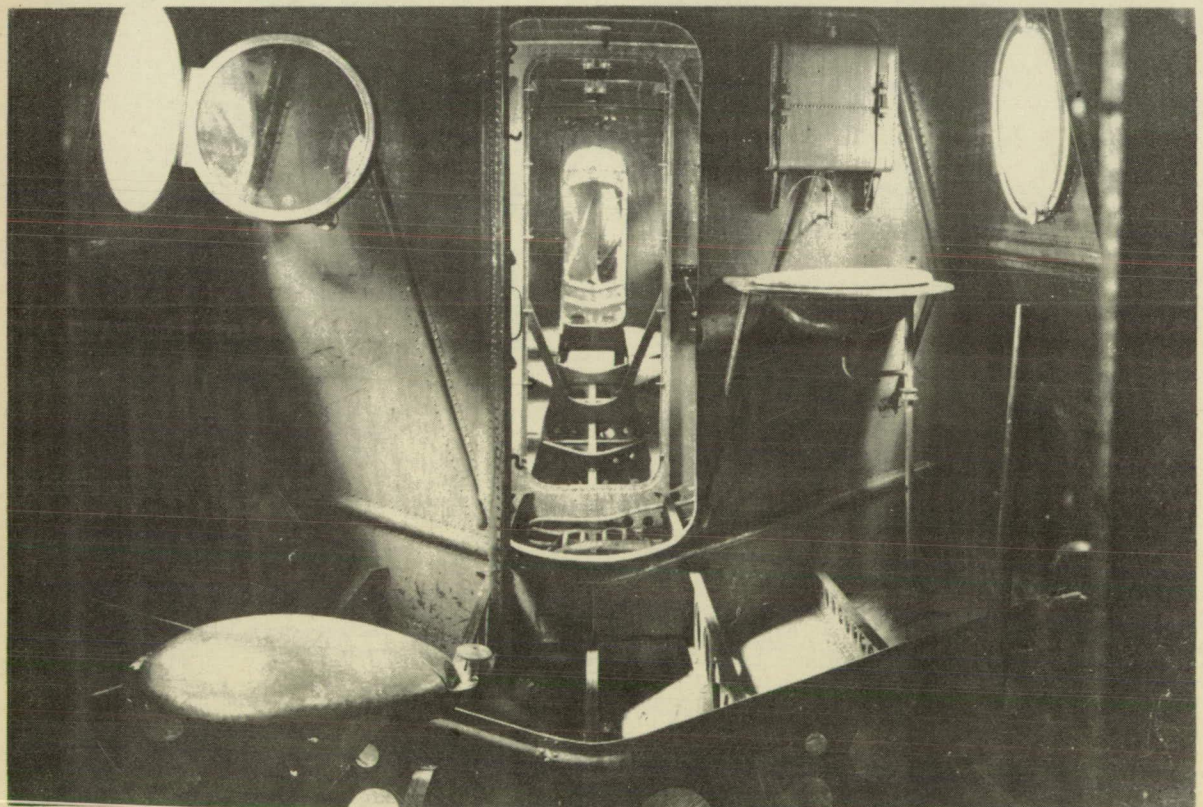


Fig. 8 Interior view of the Latécoère 501 seaplane looking toward bow.

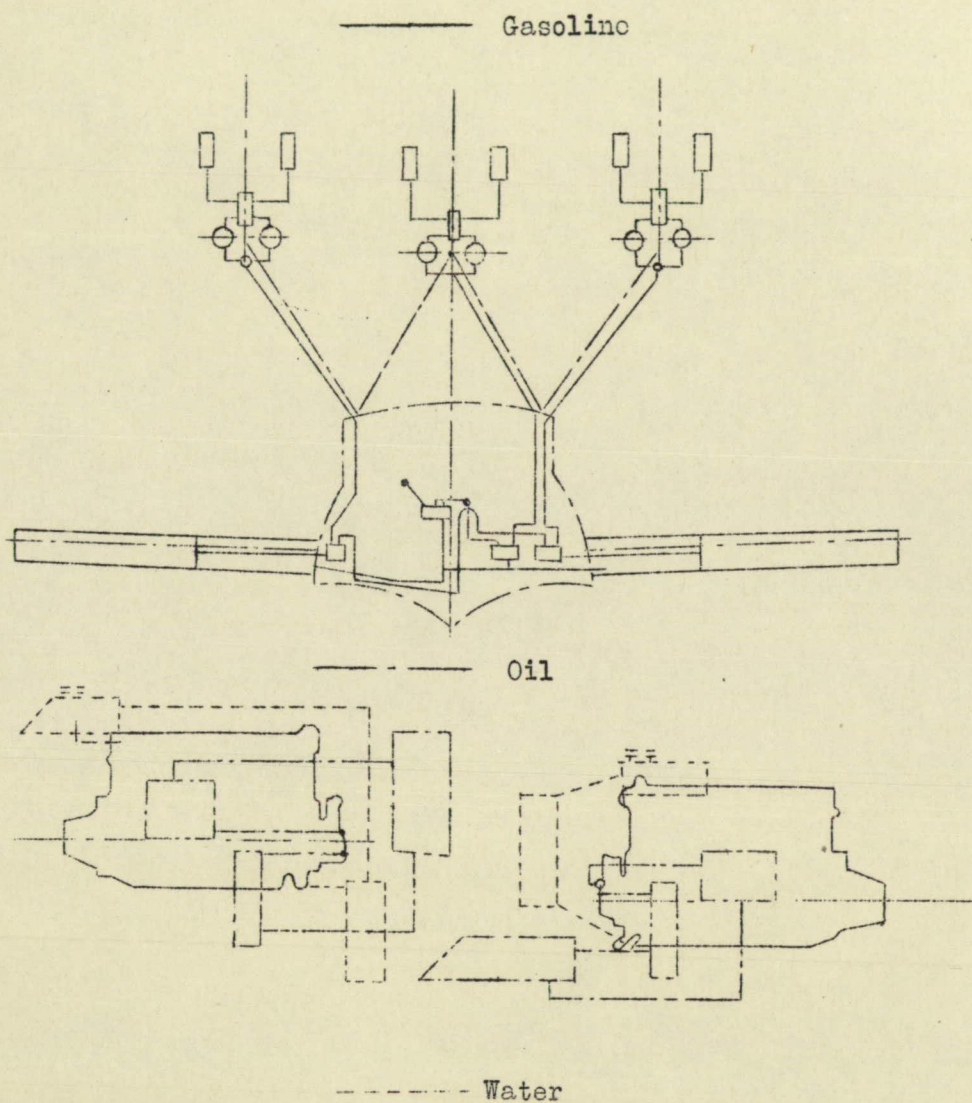


Fig. 9 Fuel and cooling systems of the Latécoère 501 seaplane.

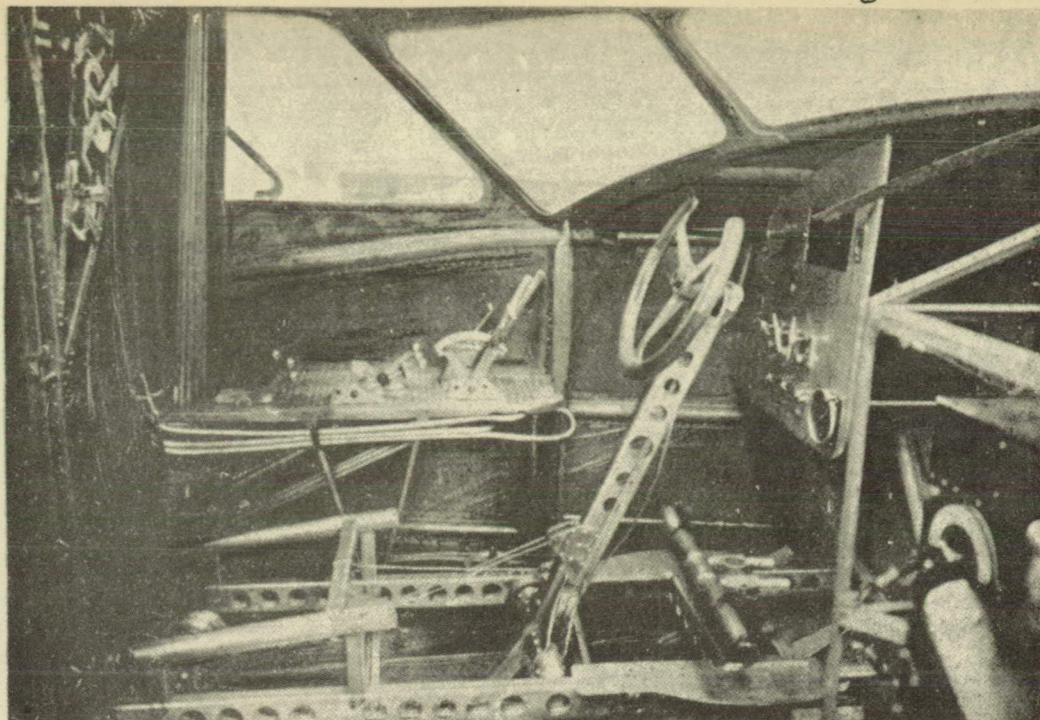


Fig.10 Pilots seat (on left) with single control

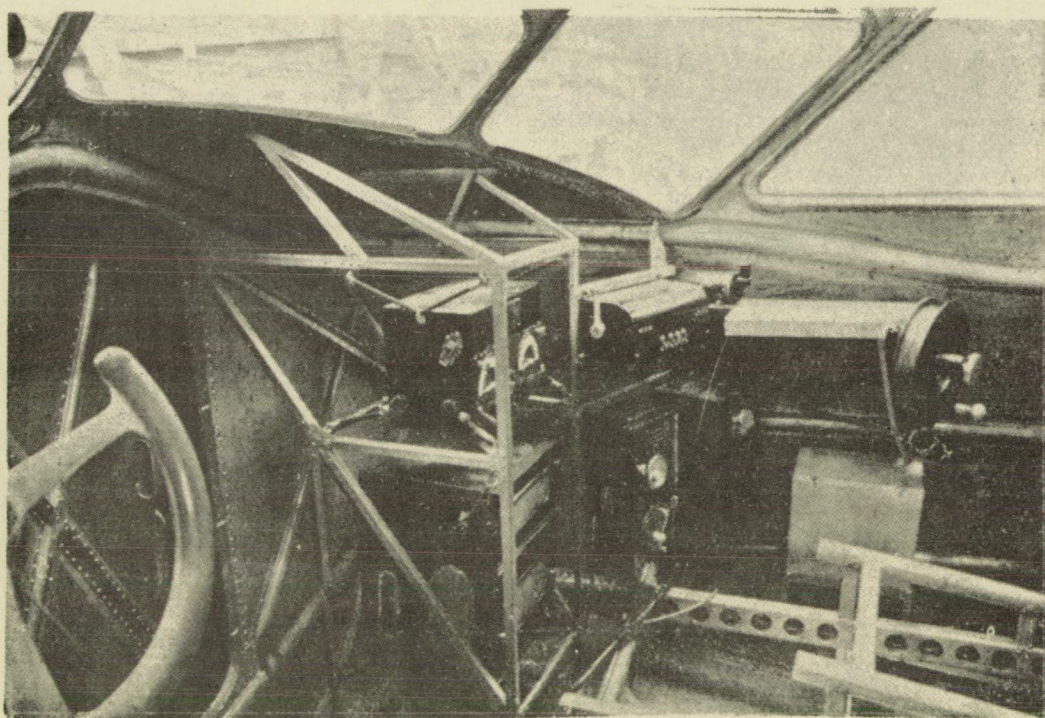


Fig.11 Navigator's station with radio