

AIRCRAFT CIRCULARS
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 136

LATÉCOÈRE 38-O FLYING BOAT (FRENCH)
A Long-Range Sesquiplane for Carrying Mail

Washington
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LATECOÈRE 38-0 FLYING BOAT (FRENCH)*

A Long-Range Sesquiplane for Carrying Mail

The Latécoère 38-0 was designed by the "Société Industrielle d'Aviation Latécoère" for the "Compagnie Générale Aéropostale" as a transatlantic mail seaplane (Figs. 1, 2, 3 & 4).

It has a sesquiplane cell. The principal wing, which has an area of 130 m² (nearly 1400 sq.ft.), is mounted about 1 m (3.28 ft.) above the hull on a vertical cabane braced laterally by two pairs of struts and longitudinally by two diagonal struts. It has a rectangular plan form with elliptical tips and an aspect ratio of seven. It has a uniform profile of medium thickness and its lower side is slightly cambered.

The lower wing is divided into two parts, one on each side of the hull to which they are joined. They have a medium-thick profile, increase the lateral stability of the seaplane on the water and facilitate its take-off. They also serve to distribute the stresses from the struts. The struts are streamlined duralumin tubes with steel fittings. They reduce the overhang of each half of the main wing to 7.7 m (25.26 ft.).

The ailerons, each consisting of two parts, are long and narrow and have rigid controls. They are provided with narrow balancing flaps, which occupy nearly the whole of their trailing

*From "Les Ailes," Jan. 1, 1931, "L'Aéronautique," December, 1930, p. 458, and data furnished by the makers.

edge. These flaps are operated automatically by the aileron control.

The all-metal wing structure consists of two box spars 2.2 m (7.22 ft.) apart, lattice ribs made of tubes and compression members braced by steel wires. The covering is of fabric. Each part of the lower wing has two I spars, lattice ribs and a light-metal covering. The different elements of the Latécoère are assembled by tubular rivets.

The hull, made entirely of light metal, has a length of 15 m (49.21 ft.) and a maximum width of 2.5 m (8.2 ft.). The prow is sharp at the bottom and widens toward the top. It has two steps, one at 6.8 m (22.31 ft.) from the stem for taking off; the other, 3 m (9.84 ft.) farther aft, for alighting. Its structure consists essentially of numerous frames joined by the keel and keelsons and stringers to which the light-metal covering is riveted (Figs. 5 & 6). The frames, keel and keelsons have webs of sheet duralumin, plain or open-worked, with riveted flanges. Moreover, the frames have inside tubular frames, some of which are still further reinforced by triangular frames. Four of these frames or bulkheads divide the hull into five compartments. These frames are provided with automatically closing doors.

The covering is protected from the action of sea water by an oxidizing bath and a coat of white lead. Moreover, all the fittings and joints are made perfectly water-tight.

The horizontal empennage consists of a stabilizer of 10.5 m^2 (113.02 sq.ft.) and a two-part elevator of 8.6 m^2 (92.57 sq.ft.). The stabilizer is braced above by four streamlined steel wires and below by two sets of N struts. The vertical empennage consists of a fin of 4 m^2 (43.06 sq.ft.) and a rudder of 4.65 m^2 (50.05 sq.ft.). The latter is provided with small balancing flaps fitted into the trailing edges. These flaps can be set during flight at the will of the pilot. The elevator and rudder are operated by flexible controls. All the tail surfaces have duralumin frames covered with fabric.

The first compartment of the hull near the prow serves as the maneuvering post when the seaplane is on the water. It has a trap door for casting out the mooring ropes, the grapnel and the floating anchor. Behind this compartment is the baggage room and then the pilot room with sliding side and overhead windows. It has seats for two pilots with disconnectible dual controls for the second pilot on the right. It also contains the small starting motor. Behind this compartment is the radio room with long and short wave sending and receiving sets. This room also contains radiogoniometric apparatus, storage batteries, antenna reel, map holders and provision reserves. The following compartment contains the fuel tanks on both sides of a central passage, which leads to the crew's cabin, lighted and ventilated by portholes. Two superposed berths and a seat enable the members of the crew to rest when off duty. Lastly come the lavatories and another baggage room.

The Latécoère 38-0 is equipped with two Hispano-Suiza 12 Nbr engines with a rated output of 650 hp and capable of furnishing 740 hp at 2100 r.p.m. These engines are mounted tandem above the wing on two sheet-duralumin boxes, which are connected with the central part of the wing by a lattice girder. The whole is enclosed in a streamlined cowling of sheet duralumin. An opening in the wing, directly over the hull and between the engines, enables the inspection of the principal accessories of the engines.

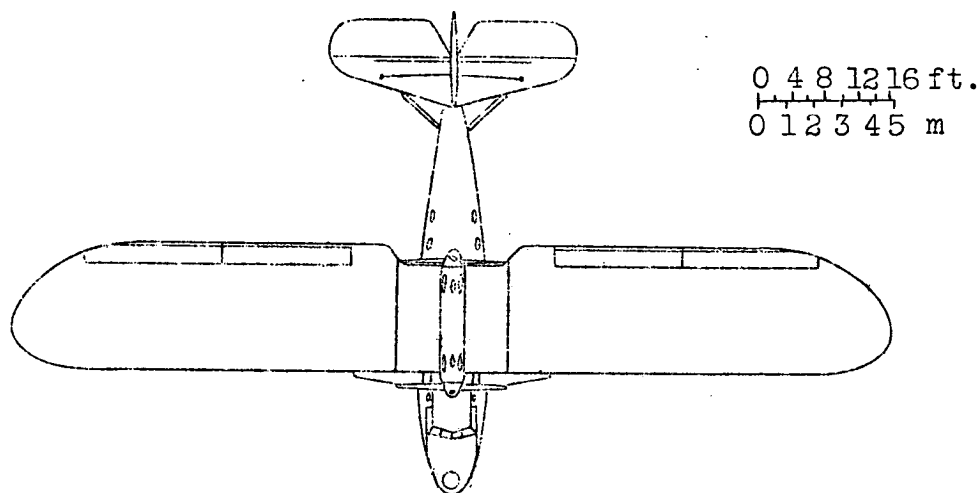
The water is cooled by radiators, on the lower side of the wing, of sufficient area to function properly in the tropics. The duralumin fuel tanks are located in a special compartment inside the hull. This compartment likewise contains all the control cocks and a hand pump. The fuel is delivered by A.M. pumps. The tanks are provided with a device for quick emptying in flight. The oil tanks are placed inside the engine cowling. Each tank has a face flush with the outside of the cowling which aids the cooling, this action being supplemented by oil radiators on the sides of the engine nacelle.

Characteristics

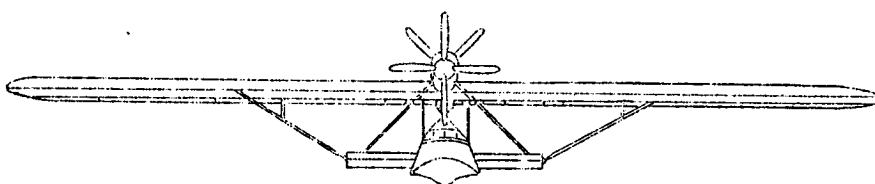
2 Hispano-Suiza 12 Nbr 650 hp engines 1300 hp		
Span	31.40 m	103.02 ft.
Total length	16.75 "	54.95 "
Maximum height	6.04 "	19.82 "

Area of wing	130.00 m ²	1399.31 sq.ft.
Area of elevator	8.60 "	92.57 " "
Area of rudder	4.65 "	50.05 " "
Area of stabilizer	10.50 "	113.02 " "
Area of fin	4.00 "	43.06 " "
Wing loading	79 kg/m ²	16.18 lb./sq.ft.
Power loading (1300 hp)	7.9 kg/hp	17.18 lb./hp
Capacity of fuel tanks	5220 liters	1379 gal.
Capacity of oil tanks	290 "	76.6 "
Weight empty with water	5087 kg	11215.0 lb.
Standard equipment	70 "	154.3 "
Special equipment	300 "	661.4 "
Dead load	5457 "	12030.7 "
Fuel	3730 "	8223.2 "
Oil	270 "	595.2 "
Crew	320 "	705.5 "
Freight	500 "	1102.3 "
Disposable load	4820 "	10626.2 "
Full load	10277 "	22656.9 "
Safety factor	5	
Maximum speed at sea level	210 km/h	130.5 mi./hr.
Cruising speed	160 "	99.4 "
Range	3500 km	2175 mi.

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



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Height	6.04 m	(19.82 ft.)	
Length	16.75 m	(54.95 ft.)	



Two
650 hp
Hispano-Suiza
12 Nbr
engines

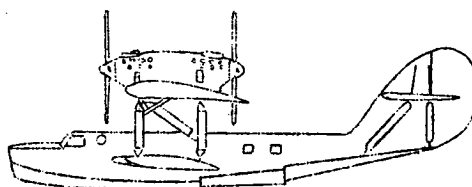


Fig.1 General arrangement drawing of the Latécoère 38-0 seaplane.



Fig.2

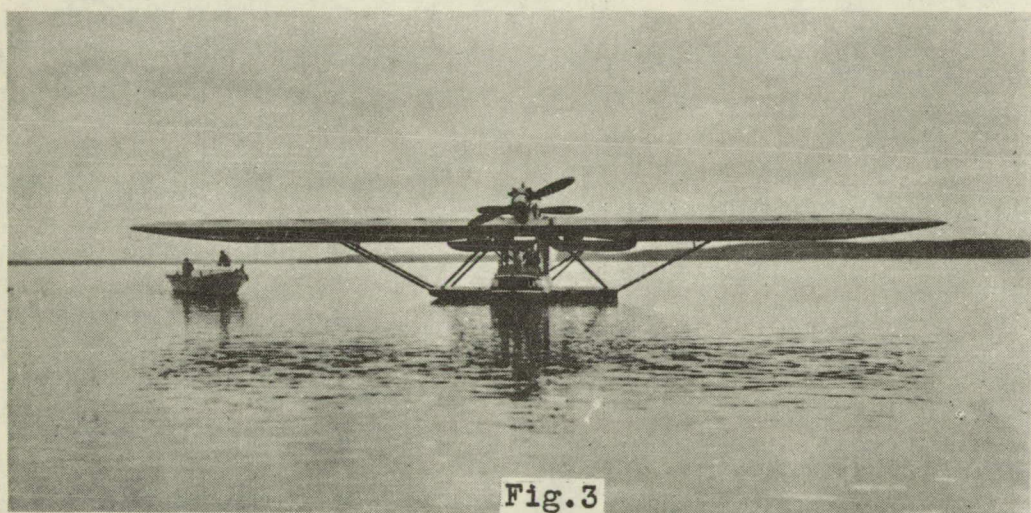


Fig.3

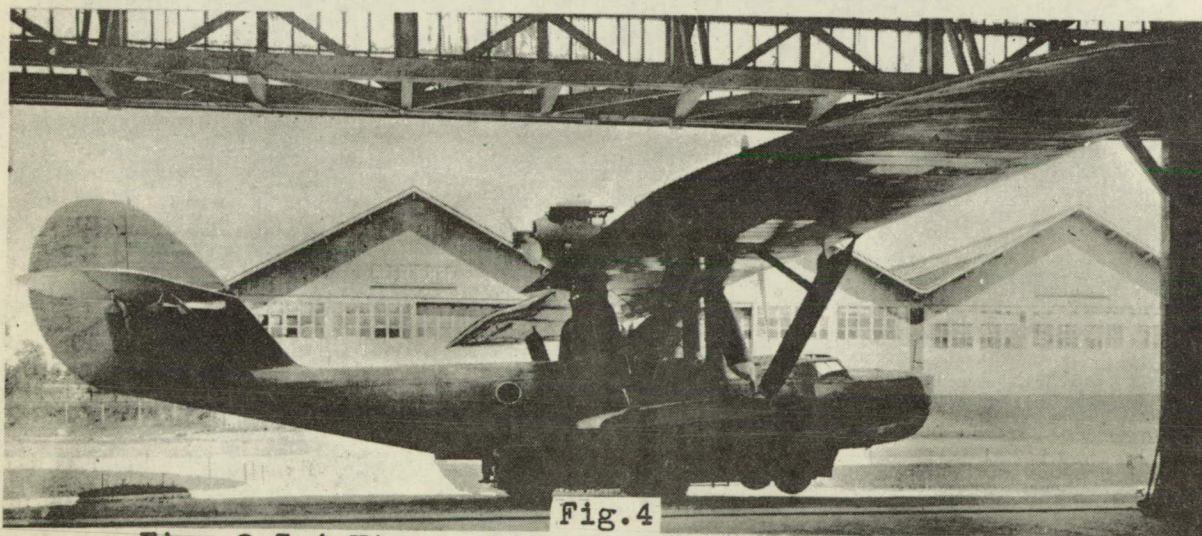


Fig.4

Figs.2,3,4 Views of the Latécoère 380 transatlantic mail seaplane.

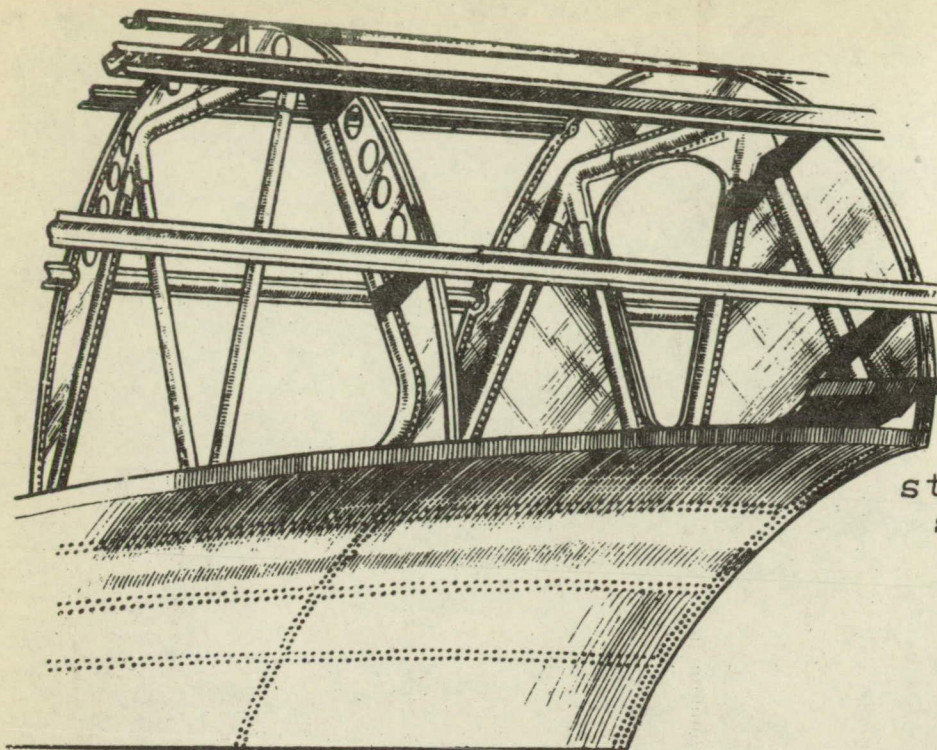


Fig.5
Portion
of hull
structure
showing
bulkheads.
The one
at the
right can
be closed
by a door.

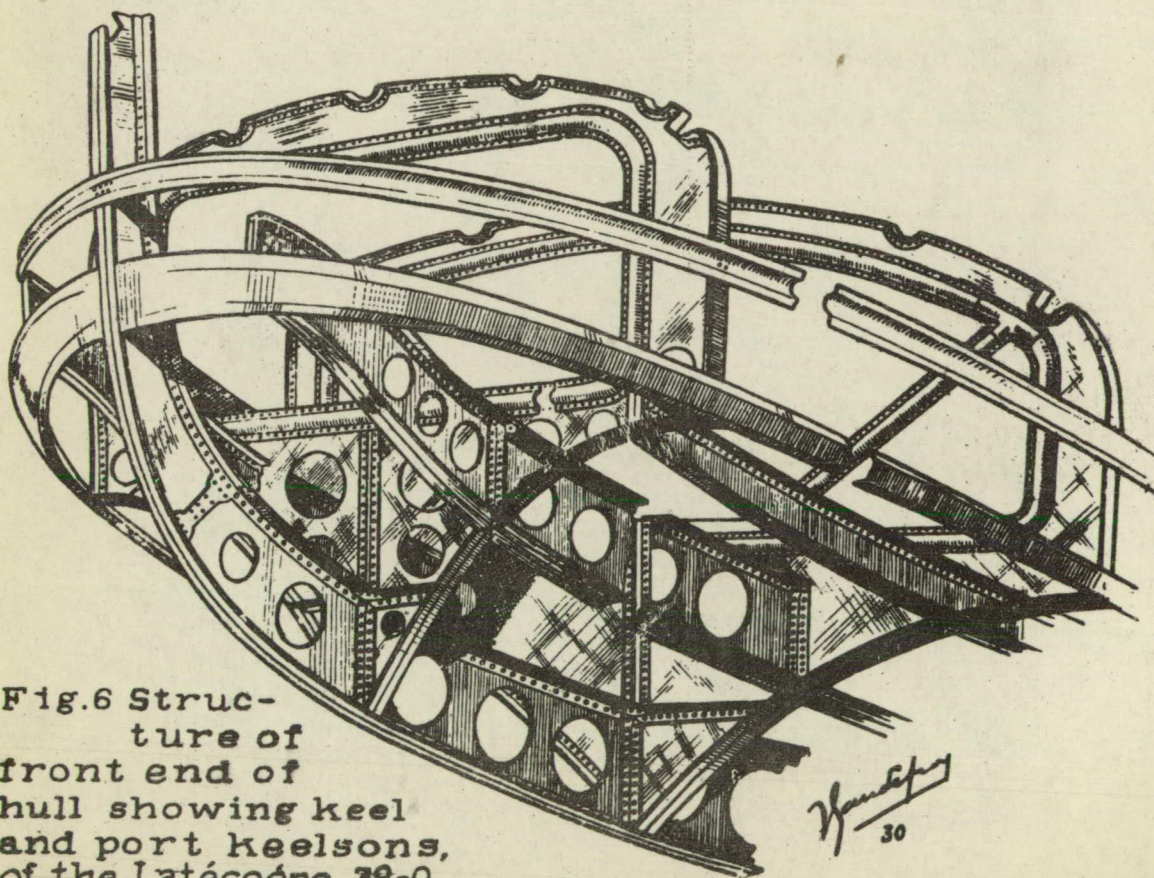


Fig.6 Struc-
ture of
front end of
hull showing keel
and port keelsons,
of the Latécoère 38-0.

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