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AIRCRAFT CIRCULARS
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 29

NIEUPOORT-DELAGE PURSUIT AIRPLANE 48 C.1
(*"Jockey"* Type)

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Advisory Committee
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AIRCRAFT CIRCULAR NO. 29.

NIEUPOORT DELAGE PURSUIT AIRPLANE 48 C.1.*

("Jockey" Type)

This is a light single-seat pursuit airplane with a tractor propeller actuated by a 12-cylinder V-type Hispano-Suiza engine, giving 400 HP. at 2000 R.P.M. (equivalent to 450 HP.). The cylinder bore is 120 mm (4.72 in.) and the piston is 130 mm (5.12 in.) (Figs. 1-4).

The fuselage consists of a cloth-covered shell of circular cross section with a maximum diameter of 1 meter (3.28 ft.) and a length of 5.095 m (16.72 ft.). This shell was made by gluing together (cold) successive strips of white wood 0.9 m (0.035 in.) thick. It was made in two longitudinal parts. These parts came from the mold along with their longerons, which extend from one end to the other and have a trapezoidal cross section. The two parts were joined, after the engine bed had been installed, by means of the tail-skid band mounting and by metal bulkheads which, with the longerons, assure the rigidity of the whole.

The engine bed, consisting of vertical and horizontal beams, and the main bulkheads at the points of attachment of the wings and landing gear, form a rigid framework of duralumin, which is bolted to the shell. The vertical beams are prolonged at the back of the pilot's cockpit and serve for the attachment of the pilot's seat and steering controls.

*Translation from the French.

The cell consists of an upper or main wing and the fairing of the landing-gear axle. The latter forms a small lower wing, so that the airplane is sometimes spoken of as a sesquiplane. The upper wing consists of halves, which are attached to the fuselage by means of a triangular cabane of duralumin tubes, whose lower ends are secured to the main bulkheads. On each side of the fuselage a single streamlined adjustable strut, attached to the landing gear, assures the rigidity of the whole cell. Each strut consists of two duralumin halves and has the form of a Y whose two upper branches are attached to the two wing spars.

The shape of the wing section or profile is maintained by plywood ribs attached to the spars. Transverse and longitudinal spruce strips transmit the stress to the ribs, which in turn transmit it to the spars. The duralumin spars are formed of webs and flanges, whose number varies according to the stress to be withstood. These two parts are joined by brackets. The wings are braced by duralumin tubes and piano wires. The leading edge, of spruce, is reinforced above and below, by a covering of plywood. A small piano wire forms the trailing edge. The normal covering is cloth.

The horizontal empennage, elliptical in shape, is supported by a spar passing through the center of gravity of its surface. This spar has the form of a box girder and is bolted to the rear bulkhead. This method of attaching enables the removal of the

tail surfaces. The leading edge of the stabilizer is secured by gudgeons to a steel tube passing through the fuselage. The cross-sectional shape of the stabilizer is maintained by longitudinal and transverse ribs of plywood. The whole is covered above and below by plywood as far as the rear spar, to which is hinged the single unbalanced elevator of similar construction.

The vertical fin, likewise demountable, is formed of longitudinal and transverse ribs, covered with plywood. It is held by the rudder post, which is bolted to the rear bulkhead, even with the main spar of the horizontal stabilizer. The rudder is hinged to the rudder post. The elevator and rudder horns are entirely concealed by the housing which streamlines the rear end of the fuselage.

The landing gear (Fig. 3) consists of two V-struts of sheet duralumin, under which is attached the landing-gear fairing. Each strut consists of two stamped parts riveted together at their edges.

The landing-gear wing is essentially a hollow duralumin girder, inside of which can oscillate the two movable semi-axles of steel tubing, which are hinged at their inner ends to boxes integral with the girders. At each end of this girder and inside of it, there is riveted a sheet of stamped steel which receives, on its upper side, the pin for attaching the landing struts, the shackle for a brace wire and the pin for the wing strut. Under each end of this girder a bobbin for the shock

absorber is attached at right angles to the axle. The axle and bobbin are mounted or demounted together, thereby facilitating repairs to the rubber shock absorbers. This girder carries, moreover, both fore and aft, a series of ribs covered with sheet duralumin so as to form a small wing.

Fig. 3 is a view of the landing gear, showing at each end the fittings for the wing struts and landing-gear struts, the brace-wires and the bobbins for the sandows. The two openings in the fairing afford access for mounting and demounting the semi-axles.

The directional steering is controlled by the feet by means of two guided cross pieces which are connected with the rudder and move horizontally. The elevator and ailerons are operated by the same control stick. The elevator and rudder are operated by cables and the ailerons by tubes and rigid rods, which enable the use of either aileron in case the other one is broken.

The engine is completely concealed in the fuselage. The nose of the latter and the propeller hub are streamlined by a suitable housing. The fuel is delivered by two A.M. pumps operated by the engine. The fuel tanks, which can be cast off during flight, are in the upper wing on both sides of the fuselage. The oil tank, whose outer wall forms a radiator, is located in front of the engine. The water is cooled by two Lamb-
lin radiators on the landing struts, with a gravity water tank.

The armament consists of two machine guns.

General Characteristics

Length	6.40 m	21.00 ft.
Span	10.00 "	32.81 "
Height	2.78 "	9.12 "
Area of upper wing	18.38 m ²	197.84 sq.ft.
Area of axle fairing	1.00 "	10.76 "
Total supporting area	19.38 "	208.60 "
Stabilizer	2.64 "	28.42 "
Elevator	0.66 "	7.10 "
Horizontal empennage	3.30 "	35.52 "
Fin	0.67 "	7.21 "
Rudder	0.55 "	5.92 "
Vertical empennage	1.22 "	13.13 "
Weight equipped*	1032.00 kg	2275.17 lb.
Disposable load**	98.00 "	216.05 "
Weight of fuel for 1.5 hours	160.00 "	352.74 "
Full load	1290.00 "	2843.96 "

*The "weight equipped" is the weight of the airplane as it leaves the factory, with its permanent equipment as follows: water, instruments, machine guns, sighting devices, parachute, fire extinguisher, starter.

**The "disposable load" comprises:

The pilot	75 kg	165.35 lb.
700 cartridges	23 "	50.71 "

Power loading	3.225 kg/HP.	7.01 lb./HP.
Wing loading	66.6 kg/m ²	13.64 lb./sq.ft.

Performances

Speed at 1000 m	(3280.8 ft.)	273 km/h	169.63 M.P.H.
" "	2000 " (6561.7 ")	272 "	169.01 "
" "	3000 " (9842.5 ")	269 "	167.15 "
" "	4000 " (13123.3 ")	263 "	163.42 "
" "	5000 " (16404.2 ")	255 "	158.45 "
Climb to 1000 "	(3280.8 ")	2 min. 14 sec.	
" "	2000 " (6561.7 ")	4 " 21 "	
" "	3000 " (9842.5 ")	6 " 54 "	
" "	4000 " (13123.3 ")	10 " 39 "	
" "	5000 " (16404.2 ")	16 " 16 "	
" "	6000 " (19685.0 ")	27 " 24 "	
" "	6500 " (21325.4 ")	40 " 16 "	

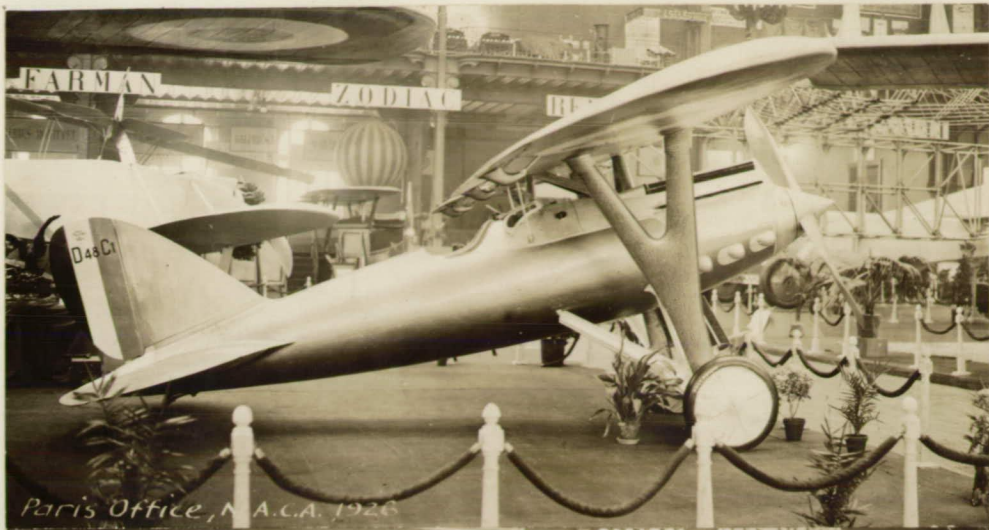


Fig.1



Fig.2

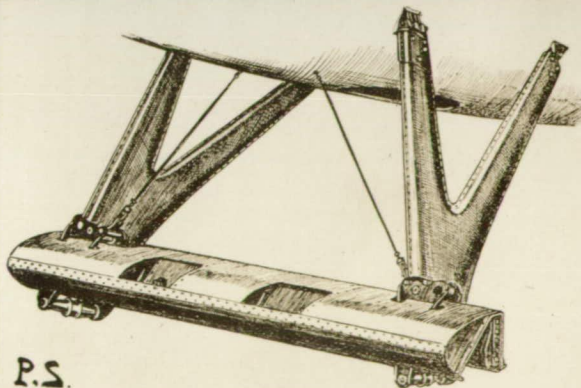


Fig.3

Views and landing gear of the Nieuport-Delage 480-1 pursuit airplane with 400 HP.Hispano-Suiza engine.

P.S.

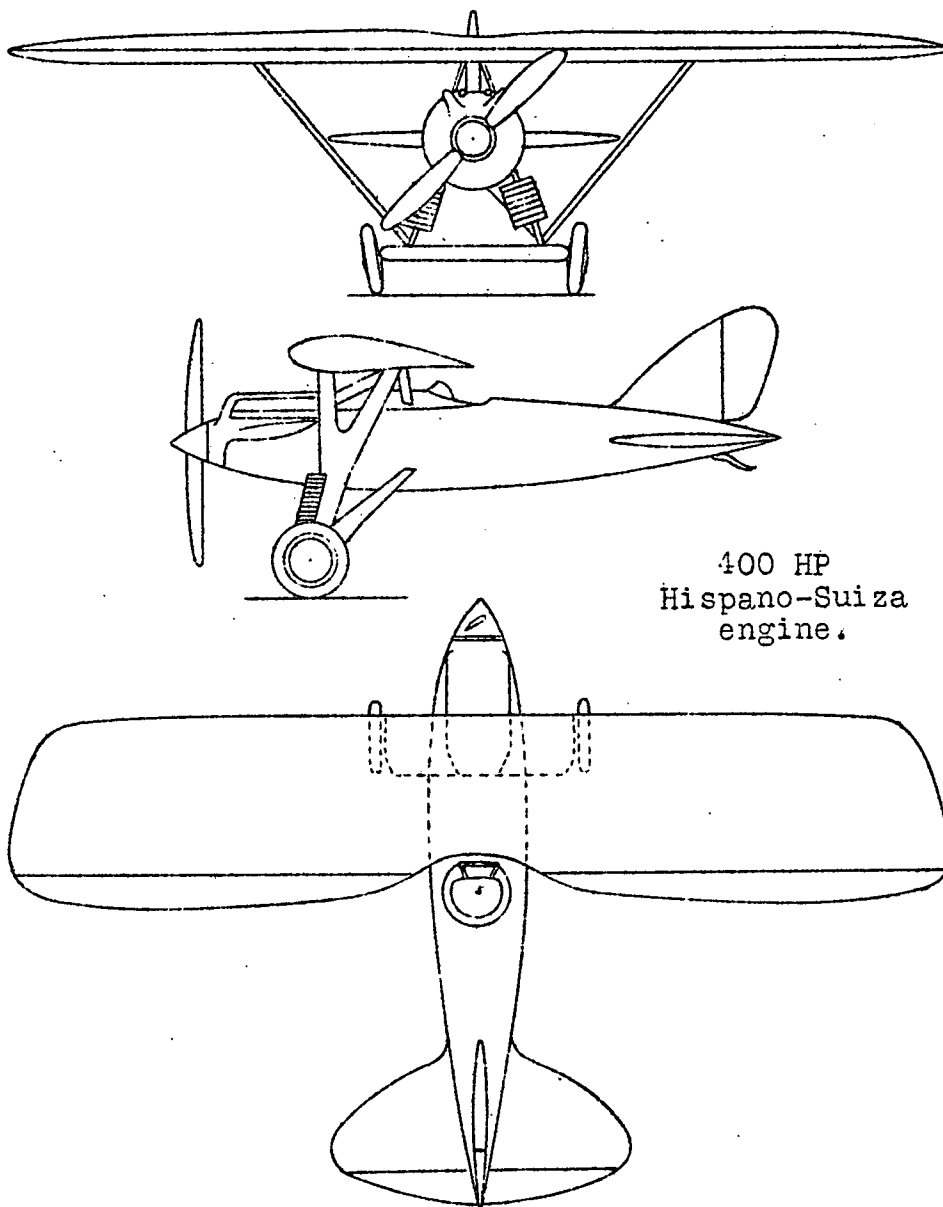


Fig. 4 Nieuport-Delage 48C-1 pursuit airplane.