

AIRCRAFT CIRCULARS
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 123

THE DYLE AND BACALAN "D.B.80" DAY MAIL AIRPLANE (FRENCH)
An All-Metal High-Wing Monoplane

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THE DYLE AND BACALAN "D.B. 80" DAY MAIL AIRPLANE (FRENCH)*

An All-Metal High-Wing Monoplane.

The Société Aérienne Bordelaise, formerly Dyle and Bacalan, which seems to specialize in large monoplanes with habitable wings, has just completed an interesting all-metal day mail airplane, the "D.B. 80" (Figs. 1, 2, and 3).

It has a tapered cantilever wing of large aspect ratio and rounded tips. Its profile gives a slight variation of the center of lift. The framework (Figs. 4, 5, and 6) is composed of three lattice spars whose flanges support the fabric covering. These spars are joined by transverse frames. The ailerons (Fig. 7) cover nearly the whole span and can be simultaneously deflected downward for reducing the landing speed.

The fuselage framework comprises four longerons of special section metal joined by transverse frames or bulkheads (Fig. 13). The pilot's seat is inside under the leading edge of the wing. Behind it there are two seats for passengers. A door on the left side affords entrance to the well-lighted cabin. A removable partition separates the cabin from the baggage room, which has a separate entrance. For carrying merchandise alone, a single room $1.75 \times 1.1 \times 1.375$ m ($5.74 \times 3.61 \times 4.51$ ft.) can be obtained by

*From L'Aéronautique, May, 1930, pp. 163-166.

removing the seats and partition.

The tail block is held by four bolts. The control surfaces are not balanced. The rigid controls are mounted on ball bearings and pass under the cabin floor. They are readily accessible through removable panels on the bottom and sides of the fuselage.

The landing gear has two independent wheels, provided with Dhainaut brakes (Fig. 12), each secured to a rigid strut forming a caisson (Fig. 10) hinged to the fuselage longerons (Figs. 9 and 11). The end opposed to the wheel attacks the elastic block (Fig. 8). The two blocks lodged in a very rigid transverse fuselage girder under the pilot's seat, may either be composed of Weydert washers with air shock absorbers, or of Hanriot oleo-pneumatic shock absorbers. It has a track gauge of about 1.9 m (6.23 ft.).

The two dumpable fuel tanks, with a total capacity of 160 liters (42.27 gallons) are installed in the wing, one on each side of the fuselage. The oil tank is located on the opposite side of the fire wall from the engine.

This airplane can be equipped either with a Lorraine 5 Pc 120-150 hp air-cooled engine, or with a 6 P 100-130 hp Hispano-Suiza engine. The mount for either engine is attached to the front end of the fuselage by two hinges and two bolts. The Lorraine mount can turn about a vertical axis to facilitate inspection. The bulkhead being attached to this mount, the number of

pipe joints to be connected or disconnected is reduced to a minimum.

Structural Details of Wing of "D.B. 80"

The structure of wing at its point of attachment to fuselage is shown in Figure 4.

The central part of wing is shown in Figure 5. The wing has three spars, the flanges of which are grooved in the direction of the span in such a way that the working section gradually diminishes toward the tips. This section, in the form of a very open V with rounded angles in the central portion of the wing, changes to an inclined δ (particularly evident in the middle spar) and then becomes semicircular. The webs are of mixed construction. In the narrower parts they are made of sheet duralumin, stiffened by vertical semicircular ribs. In the wider parts, the webs consist of open lattice work and gussets. The ribs take the form either of a trellis (V and gussets) or of sheet metal stiffened in the same manner as the spar webs. The profile is bordered by a metal angle to which the covering is riveted.

The structure of the wing tips is shown in Figure 6. Note the gradual taper of the spar webs (on which the vertical stiffeners are plainly visible), the flanges and the ribs.

The aileron and its control are shown in Figure 7, the arm for receiving the hinge pin being at the right.

Structural Details of Landing Gear and Fuselage

One of the shock absorbers is shown in Figure 8. A Weydert block is hinged to the end of a strut, as shown in Figure 10. The end of this strut is attached to the shock absorber and also to the lower part of the fuselage, the details of the joints being shown in Figures 11 and 9. The landing gear has neither axle nor brace wire and forms a very neat assembly.

Figure 12 shows a Dhainaut brake on wheel with grooved rim, the axle being attached to the lower end of the box strut.

The fuselage frame or bulkhead is shown in Figure 13.

Characteristics of the "D.B. 80" *

Engine	Lorraine with cowling	Hispano-Suiza
Span	12.00 m (39.37 ft.)	12.00 m (39.37 ft.)
Length	8.00 m (26.25 ft.)	8.75 m (28.71 ft.)
Height	2.9 m (9.51 ft.)	2.9 m (9.51 ft.)
Wing area	16.00 m ² (172.22 sq.ft.)	16.00 m ² (172.27 sq.ft.)
Weight, empty	678.00 kg (1494.73 lb.)	708.00 kg (1560.87 lb.)
Fuel	122.00 kg (268.96 lb.)	122.00 kg (268.96 lb.)
Pilot	80.00 kg (176.37 lb.)	80.00 kg (176.37 lb.)

*See footnote, page 5.

Characteristics* (cont'd)

Engine	Lorraine with cowling	Hispano-Suiza
Passengers or freight	220.00 kg (485.02 lb.)	220.00 kg (485.02 lb.)
Full load	1100.00 kg (2425.08 lb.)	1130.00 kg (2491.22 lb.)
Power, nominal	120.0 hp (118.4 hp)	100.0 hp (98.6 hp)
Power, maximum	150.0 hp (148.0 hp)	130.0 hp (128.2 hp)
Wing loading	69.00 kg/m ² (14.13 lb./sq.ft.)	70.00 kg/m ² (14.34 lb./sq.ft.)
Power loading	9.00 kg/hp (19.57 lb./hp)	11.3 kg/hp (24.57 lb./hp)
Maximum speed, sea level	200.00 km/h (124.27 mi./hr.)	190.00 km/h (118.06 mi./hr.)
Cruising speed	170.00 km/h (105.63 mi./hr.)	150.00 km/h (93.21 mi./hr.)
Practical ceiling	4500 m (14760 ft.)	3500 m (11480 ft.)
Climb to 1000 m (3280 ft.)	5 minutes	6 minutes
Landing speed	80.00 km/h (49.71 mi./hr.)	80.00 km/h (49.71 mi./hr.)
Radius of action	950.0 km (590.3 mi.)	950.0 km (590.3 mi.)

*From document furnished by the Société Aérienne Bordelaise.

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

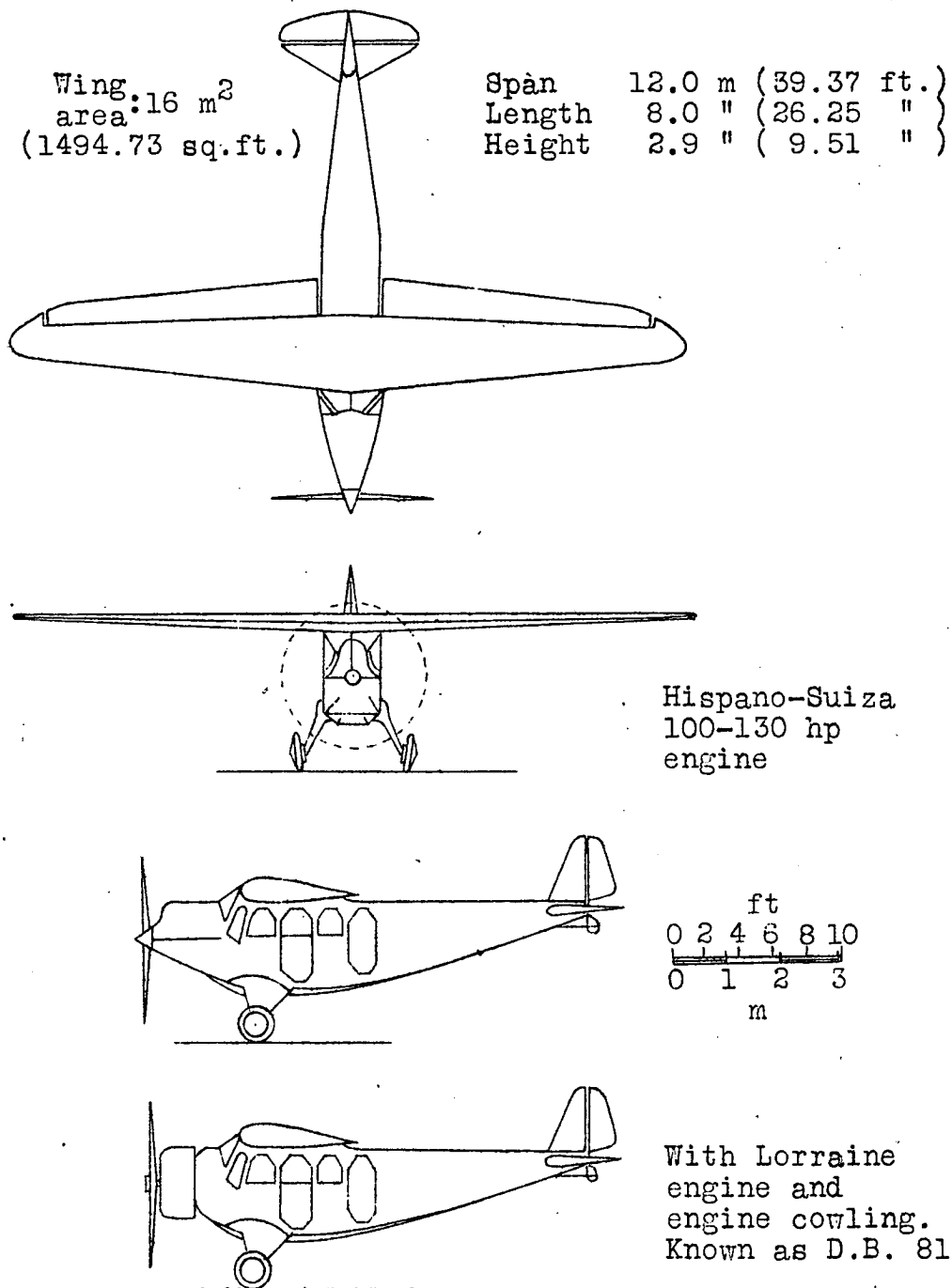
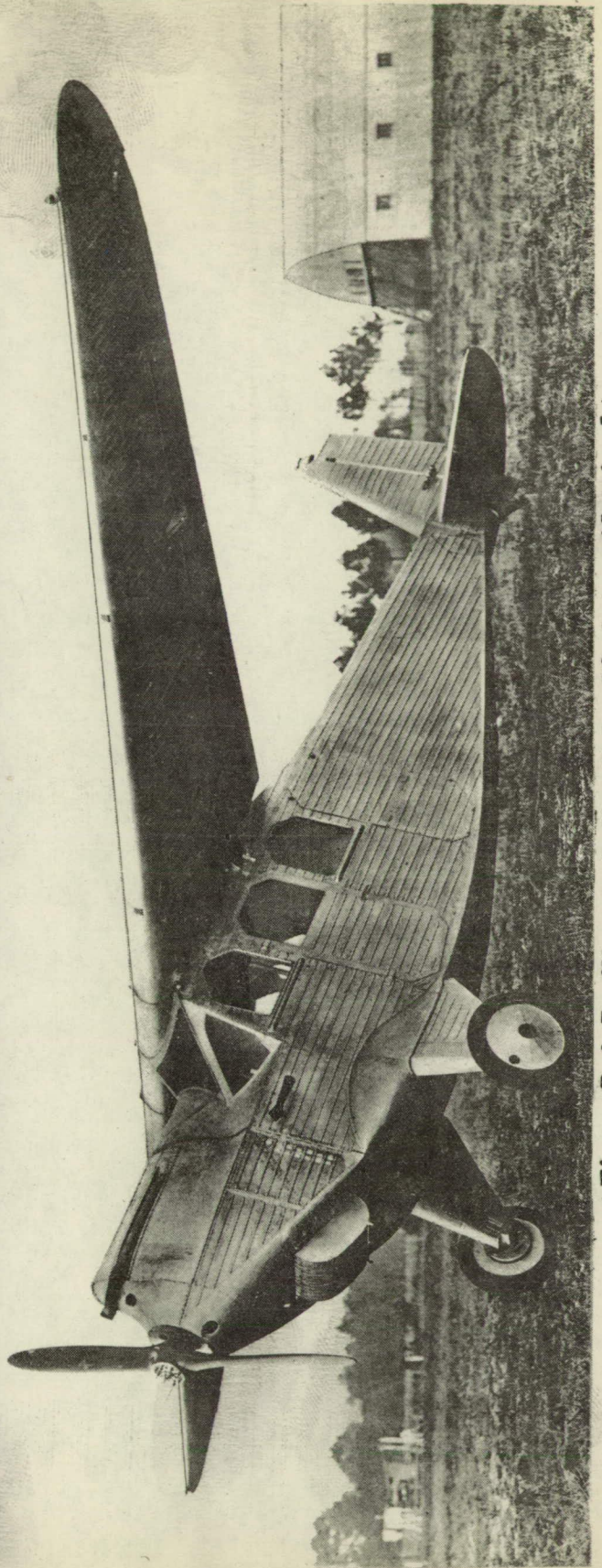
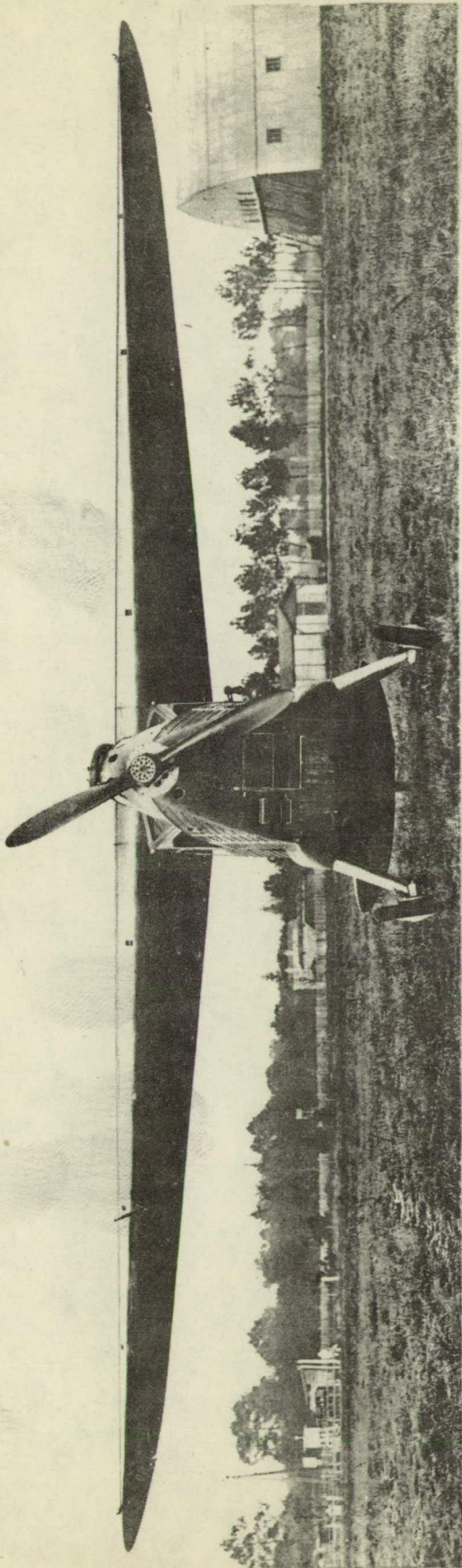


Fig. 1 General arrangement drawings of the D.B.80 day mail airplane



Figs. 2 & 3 Views of the D.B. 80 day mail airplane

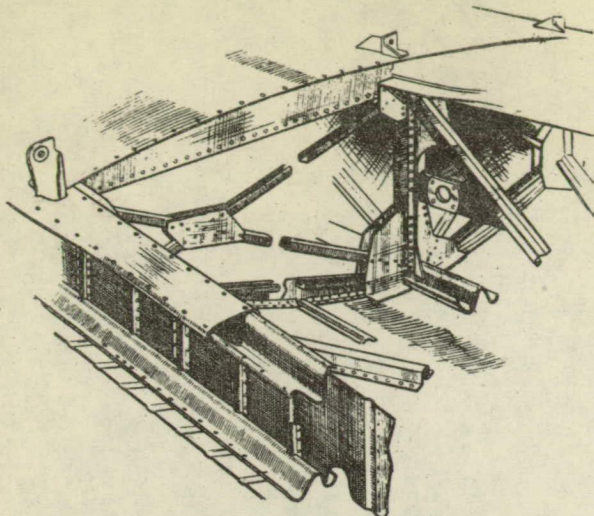


Fig. 4

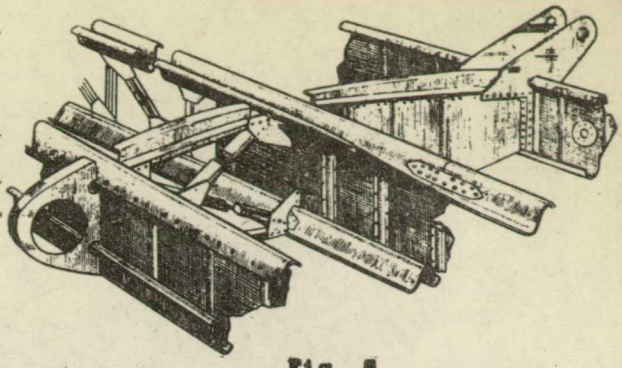


Fig. 5

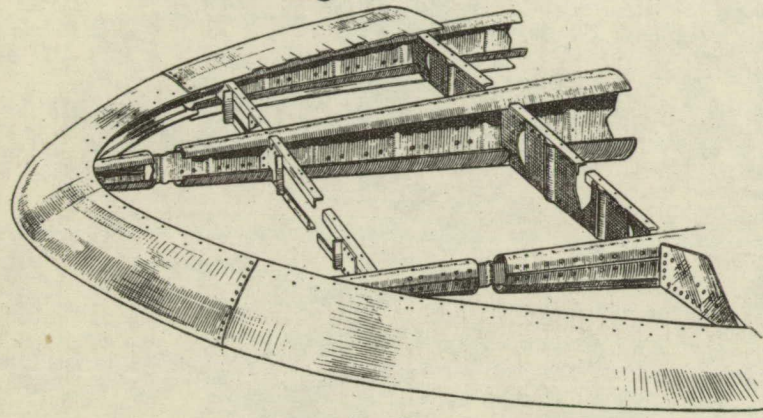


Fig. 6

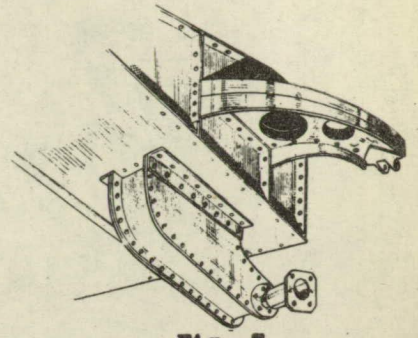


Fig. 7

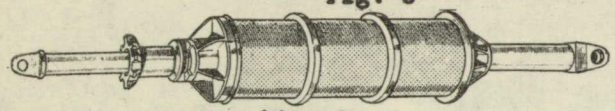


Fig. 8

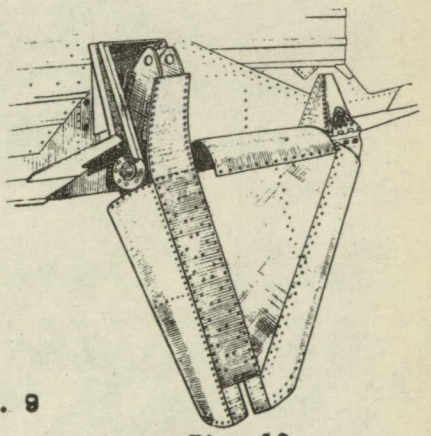


Fig. 9

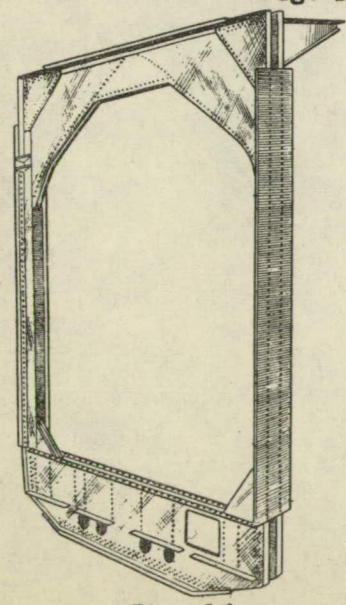


Fig. 10

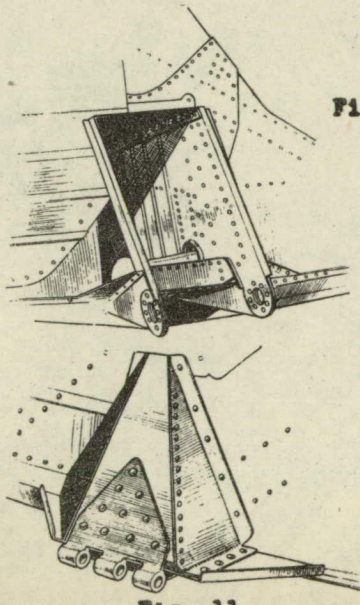


Fig. 11

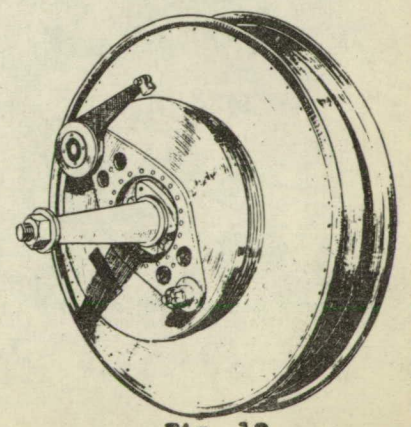


Fig. 12

Fig. 13