



Air Transport



The New Dornier Landplane

By EDWIN P. A. HEINZE

ALREADY, in the issue of October 9, FLIGHT was able to give some advance details of the new Dornier machine, the Do-K, which is at present undergoing its approbation tests. Owing to the kindness of the makers, which we duly acknowledge, the writer has received further interesting details of the machine, which give a good idea of the constructional features of the plane.

As our readers will recollect, the machine is an altogether new design, bearing no resemblance to the old Dornier "Merkur" landplane, which had a single engine and could convey six, or at most eight, passengers besides the crew of two. The Do-K has a streamline fuselage of oval section, with a cantilever type wing of entirely new form secured on top, and has ample cabin space for ten passengers. The idea of the designers was to create a fast passenger transport machine incorporating a high degree of safety for flying over country offering few possibilities of alighting in cases of emergency, such as the Alps and big deserts. For this reason high aerodynamical efficiency had to be secured, and the power plant had to be subdivided to as great an extent as was compatible with economical working. Four air-cooled Czecho-Slovakian Walter "Castor" engines of 240-h.p. output each were adopted and suspended in couples, one behind the other, beneath the wing right and left of the fuselage. The front engines have been provided with four-bladed wooden tractor screws and the rear with two-bladed pusher screws. With a full flying weight of 13,200 lb. this machine, during its trials, was able to attain a maximum speed of 137 m.p.h., the average touring speed being 125 m.p.h. and the ceiling 20,600 ft. With the same weight and one engine "dead," the machine was still able to rise to 12,800 ft., and with two engines stopped it climbed at the rate of 1.3 ft. per second at an altitude of over 3,200 ft. with the same flying weight.

The wing has a span of 82 ft., a maximum chord of 13 ft. 9 in., and a lifting area of 977 sq. ft. To secure low profile height (or wing thickness), which only amounts



THE DO K IN FLIGHT: The projections behind the engines are the mudguards over the wheels.

to 27½ in., it was found advisable to employ three spars instead of the two usually adopted. In this Dr. Dornier has followed the practice that has already proved successful in the Do-X and the recently introduced Do-S, a flying boat with cabin space for 22 passengers, which is a successor of the famous "Superwal" type. The three spars consist each of a top and bottom rail of rolled duralumin of channel section. These rails are trussed by upright and diagonal channels riveted in place, the compression members of which are reduced in weight by a number of holes in the channel beds. The wing has a practically straight rear edge, to which the leading edge sweeps round, and it tapers in thickness towards the tips.

The spars are connected by fourteen main ribs, twelve auxiliary and a large number of forming ribs. The main ribs are constructed in a manner similar to the spars and, like the other ribs, of course, also are made of duralumin. They pass over the top and bottom surfaces of the spars, to which they are secured by short channel sections riveted on. The upright and diagonal bracings likewise consist of channels. The wing panels thus formed by the main ribs and spars are braced horizontally in two planes by crossed wires. The upper channels of the main ribs between the spars being straight, forming ribs of smaller and lighter duralumin channels are superimposed. The lower channels are slightly arched upwards between the spars and for this forming ribs, which give a plane lower surface, had likewise to be employed.

A number of auxiliary spars are formed by relatively small diameter tubes of oval section passing through the joints on the main and auxiliary ribs where the upright and diagonal web channels meet. Over these tubes slipped a number of small pressed plates. Joints are formed by three rivets placed equidistantly around the circumference, with a distance-piece between, and they serve to hold the top and bottom channels of the light forming ribs, which have no web structure of any kind.

The leading edge of the wing is formed by shaped



CAREFUL STREAMLINING: This side view of the Do K indicates that considerable care has been taken to reduce resistance.