

THE MARCEL BESSON H5 QUADRUPLANE FLYING BOAT

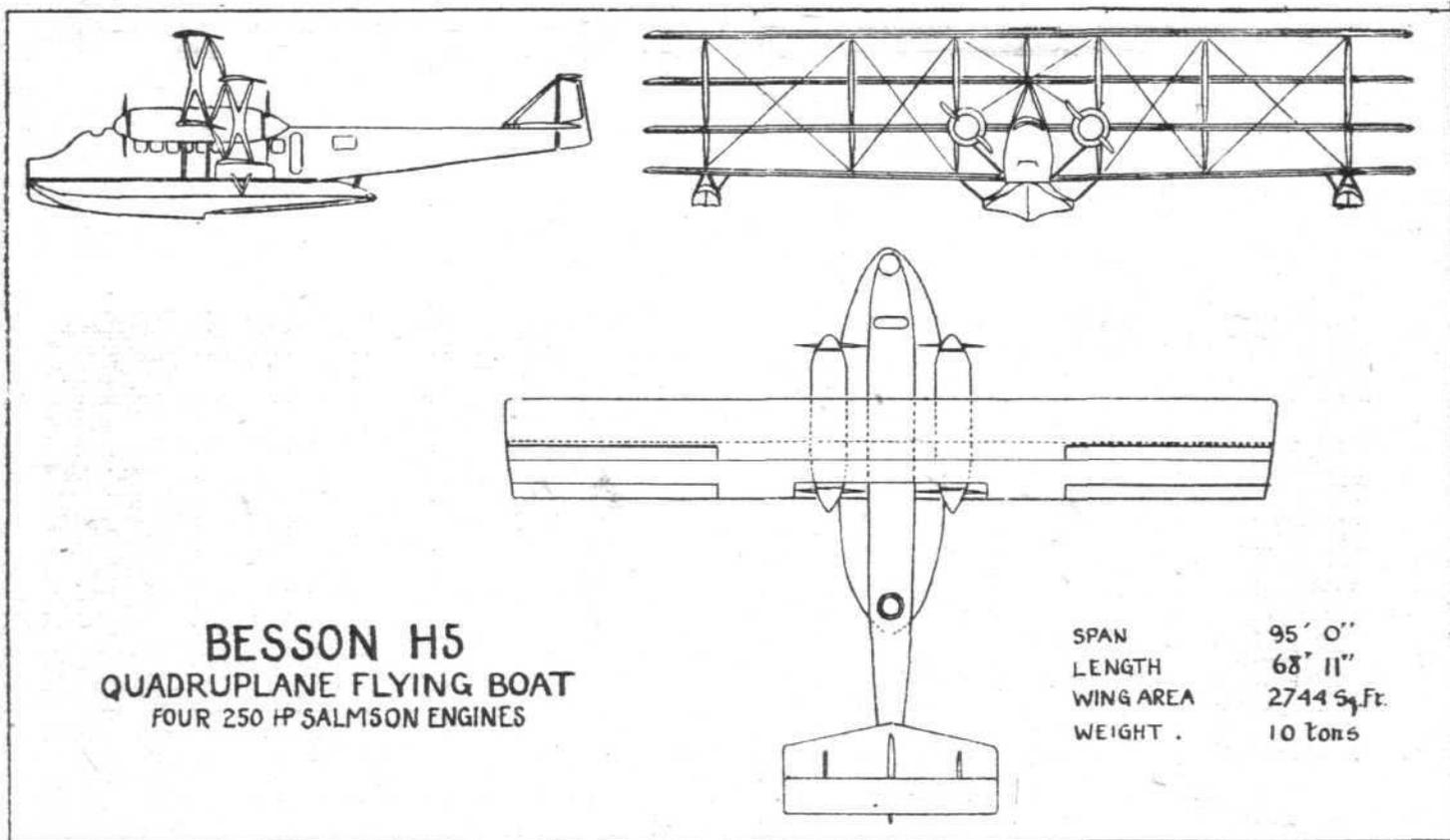
Successful and, it would seem, promising trials were carried out recently at St. Raphaël with a new and interesting type of flying boat evolved by the French firm of Marcel Besson, of Boulogne. In designing this machine, M. Besson was faced with the difficult problem of producing a craft capable of carrying heavy loads and a large number of passengers—this machine accommodates as many as 20—but which at the same time would not be too unwieldy for practical purposes. For the surface required—2,744 sq. ft.—the monoplane, and even the biplane, were set aside on the score of requiring too large a span, and the multiplane was considered the only practical solution. M. Besson also favoured the flying boat, inasmuch as this type is held to possess great possibilities in the future development of air transport, especially in connection with air lines round and about the Mediterranean.

Having decided on the multiplane, M. Besson arranged his planes in quadruple form, one pair close behind the other, and each pair stepped or staggered in relation to the other. This arrangement, from an aerodynamical point of view, is open to question, on account of the probable interference between the forward and rear pairs of planes. It is stated, however, that the trial flights demonstrated that there was little or no interference, and if this is the case, further pro-

travel is also small, whereas this would be much greater if only two planes, giving the same combined total area, were employed. Consequently it is said that, for a large machine, this arrangement makes for easier piloting.

The tail group of the Besson Quadruplane is also interesting. It consists of two horizontal and three vertical surfaces. Of the former the upper and smaller surface is used as an elevator only, whilst the lower and larger surface (26 ft. 3 ins. span) serves as a stabiliser, and has an auxiliary "elevator" for adjusting the incidence for longitudinal trimming. The three vertical surfaces comprise a central triangular fin, to the trailing edge of which is hinged a rudder and two similar but smaller units mounted one on each side of the central one. The hinged flaps on these outer surfaces are normally in neutral position, but may be adjusted at the will of the pilot for the purpose of trimming the machine, should the failure or fall in power of one or other of the engines necessitate this.

Another very interesting feature of the Besson H5 is the hull. This is of the combined boat and fuselage type, consisting of a comparatively short length boat, on the top of which is mounted a more or less conventional fuselage, which carries the planes, power plant, cabin, etc., as a self-contained unit. It is possible, therefore, to remove the boat, and



THE BESSON H5 QUADRUPLANE FLYING BOAT : General arrangement drawing.

gress under service conditions with this machine, which presents so many unusual features, will be watched with interest. The Besson H5 Quadruplane is admittedly an experimental machine, and it is proposed to give it a thorough trial in the near future on the Marseilles-Algiers line, for which purpose new 300 h.p. Salmson engines will replace the present old 250 h.p. engines of similar make.

We give herewith a brief description of this machine. The main planes are of comparatively thick section, and have a high aspect ratio. The upper and third planes are located a little less than the chord width in advance of the second and bottom planes. Each pair of planes has an arrangement of X interplane struts, whilst struts also connect the rear spars of the forward planes to the front spars of the rear planes. The whole wing cellule is divided into three bays each side. The arrangement of struts has enabled the wire bracing to be reduced to a minimum. The lowermost plane is set at a dihedral angle—about $1\frac{1}{2}^\circ$. Ailerons are fitted to all four planes; these ailerons, it will be seen, are long and narrow, and although their individual effectiveness may be slight, their combined action should give ample control.

One advantage claimed for the grouping of the main planes as adopted by M. Besson is that the travel of the centre of pressure for each plane is small, and therefore the total c.p.

substitute wheel-gear, and thus convert the machine into a land 'bus. Wing-tip floats of ample proportions are fitted to the lower planes.

The boat hull is of the V-bottom single step type, 11 ft. 6 ins. beam by 46 ft. in length, and is very strongly constructed so as to withstand rough seas. It is built up of three-ply mahogany, with linen in between the layers, riveted to cross members. The whole hull is divided up into 24 watertight compartments in order to keep the machine afloat in the event of local damage to the hull. The fuselage, as previously stated, is of conventional construction, fabric covered. The pilot's cockpit, which is provided with dual control, is located high up in the forward portion of the fuselage, and immediately behind is a large and roomy cabin accommodating 20 passengers, and provided at the rear with a lavatory. Behind the cabin is the wireless operator's cockpit. In addition to the usual engine controls in the pilot's cockpit, an engine "telegraph" system, communicating with the mechanics within the cabin is also provided, so that the engines may be controlled much in the same way as on board ship.

The engines at present fitted are four 250 h.p. Salmsons, arranged two in tandem on each side of the fuselage and in line with the third (from top) plane. Each pair of engines is enclosed in a streamline nacelle, and the front engines, driving