



Four F.5s: (Downwards on left) production version, showing both the balanced ailerons and the balanced elevators; N.4838, with experimental ailerons; and N.177, the first military flying-boat to have an all-metal hull, which was built by Short Bros; (above) N.178, with experimental hull by Saunders.

drove four-bladed propellers. All the engines were mounted on the central mainplane.

The Fury hull was regarded as the best of all the Porte hulls built at Felixstowe. It was 60ft in length from bows to sternpost and had a maximum beam of 12ft 6in. The vee-shaped planing bottom was slightly concave, whereas on all the other F-boats straight-edged sections of 150 deg included angle were used. Structurally, the hull resembled all other Porte hulls, having the usual four longerons braced to form a box girder. The big keelson and the transverse floors were of built-up girder construction; the top rail of each floor was continuous over the top of the keelson. To avoid splitting of the planking at the chine and waist joints (this had been troublesome on the F-boats) the planking of the Fury hull was carefully steamed and bent round the chines and along the fin/hull junction line; this procedure eliminated the joints. The hull planking consisted of two diagonal layers of cedar over an inner skin of longitudinal planking, and the bottom was covered with three layers of cedar and mahogany half an inch thick. Aft the fins the sides of the hull were fabric-covered.

The top and central mainplanes were of equal span and were fitted with horn-balanced ailerons. The bottom wing was one bay shorter than the others and carried stabilizing floats; it had no dihedral, but the two wings above were rigged at 2 deg.

The original tail unit was of peculiar configuration, reminiscent of the tail of the four-engined Curtiss triplane flying-boat. It was a biplane structure, in which the upper horizontal surface was of greater chord than the lower. The large fin had both its leading and trailing edges raked sharply backwards; above the upper tailplane a small balanced rudder was fitted to the fin, and two outboard rudders were pivoted between the tailplanes.

The tail unit was later moved farther aft and modified. The large central fin was removed, and there were three fins and rudders mounted wholly between the tailplanes.

The Felixstowe Fury must have been one of the earliest aeroplanes (if not actually the first) to be designed to have power-operated controls. In view of the machine's great size it was thought that in certain flight conditions the operation of the flying controls might prove to be beyond the pilot's strength. Servo-motors were therefore fitted to all controls, and longitudinal control was enhanced by using the lower elevator as a trimming surface: it was actuated separately by a long lever attached to a quadrant centred on the main elevator control shaft. When flown, however, the Fury proved to be remarkably light on all controls; in fact, it proved to be better in this respect than the smaller F-boats. The servo-motors were therefore removed, for Cdr. Porte felt that their weight and complication outweighed any advantages conferred by their use.

The designed loaded weight of the Fury was 24,000 lb, but tests showed that that figure could be increased to 28,000 lb without impairing the seaworthiness or take-off characteristics of the aircraft. Even at the greater weight the Fury handled better than any of the F-boats. The load was progressively increased up to 33,000 lb, at which weight Porte himself flew the great machine, taking off from Harwich harbour. The Fury was flown by several of Felixstowe's most experienced boat pilots, including Maj. T. D. Hallam, D.S.C., who took off with 24 passengers, 5,000 lb of sand ballast and fuel for seven hours.

Tests of a model of the Fury hull were conducted in the Froude tank at the National Physical Laboratory, and indicated certain modifications which might be made in order to improve the hull's

THE FELIXSTOWE FLYING-BOATS . . .

these were replaced by Rolls-Royce Eagles. All the engines were installed as tractor on the leading edge of the middle wing. The hull was of typical Curtiss design and construction, with a single step and comparatively short side fins; the wings were all of unequal span; and the tail unit consisted of a fin and three rudders, a tailplane and two elevator surfaces. The elevators did not move in parallel, however, and one must have been used as a trimming surface.

Since nothing was heard of the Curtiss triplane, it is fairly safe to assume that it was a failure. Nevertheless it would be easy to assume that Porte was inspired to attempt the triplane configuration; when he did so, however, he produced an aircraft that was characteristically his own.

The Felixstowe Fury was originally intended to have three Rolls-Royce Condor engines of 600 h.p. each, but the flying-boat was completed before any Condors were available. A new powerplant, consisting of five Rolls-Royce Eagles, was designed: the central engine drove a pusher propeller, and was flanked on each side by a tandem pair of engines. The forward Eagle of each pair drove a two-bladed tractor airscrew; the pushers