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Interpretive sketches, with details showing the controls and three possible propeller drives: 1, seat; 2, harness; 3, elevator cables; 4, quadrant for (3); 5, aileron cables; 6, rudder cables; 7, detachable nose; 8, spruce spars, balsa ribs; 9, balsa planking; 10, transparency; 11, probable lifting arm and horizon reference. It must be emphasized that these illustrations are "Flight's" own interpretation of photographs

HMPA Puffin

PRELIMINARY DETAILS OF THE HATFIELD MAN-POWERED AIRCRAFT

ON November 21 the Hatfield Man-Powered Aircraft Club issued a statement which began: "Trials of the HMPA Puffin continue at Hatfield, and a number of successful man-powered flights under full control have been completed since the first flight on Thursday, November 16." The club is continuing to say as little as possible about the design of its aircraft, as we discussed in our report last week. But many features can be deduced from the photographs which have been released for publication.

John Wimpenny, the HMPAC chairman, first made a model of such a machine 15 years ago, and his early work was re-assessed in the light of new knowledge and formed the basis for the Puffin. The club was formed in August 1960, and membership has risen to 27. Officers are named in the caption below, but mention should be made of the great help provided by DH Technical School apprentices, and of J. N. Say and S. J. Oaten, the two instructors who supervised most of the actual construction.

Like the Southampton design, described last week, the Puffin has a conventional fixed wing and screw propeller; but the propeller is behind the tail and the gross weight is believed to be very little more than 100lb (the span, incidentally, is little less than that of the 200-ton project featured on page 849). Most of the structure appears

to be spruce and balsa. The obviously laminar wing has considerable dihedral, and the static droop disappears in level flight. A nearly flat-bottom profile seems to have been chosen, and the covering appears to be Mylar or even balsa back to about 70 per cent chord and a transparent doped tissue aft.

Most of the body appears to have a balsa skin, although the removable nose is obviously skinned with something like a heavy grade of tissue (Cellophane or Mylar transparencies being inserted ahead of the pilot). The main "bicycle frame" appears to be of light-alloy tube, and the major loads are concentrated near the leading edge of the two root ribs. At the same points are attached the moulded seat-pan and padded shoulder harness, which reacts against forwards and upwards (pedal) loads. Ahead of the main frame is a wooden triangulation carrying the nose skid.

Pilot attitude is the classic one of a racing cyclist, with body bent well forwards and hands on a low-mounted handlebar. The latter is suspended on a subassembly off the main frame, pivoted to a fore-and-aft rotating tube, the rear bearing of which also carries the aileron pulleys. The rudder cables run aft inside a sheath, presumably to prevent chafing against the pilot's legs; aileron control is pure aircraft practice, as the drawings show (although we know nothing of the surfaces themselves); and the elevators appear to be operated by coupled twist-grips and Bowden cables moving the quadrants above the main wheel.

Although it has full-size crank throws, the latter is appreciably smaller than that of a normal racing cycle, and appears to be a 24in wheel carrying a relatively thick tyre. Inboard of the left-hand crank is a bevel gear from which the drive is taken to a light-weight shaft running aft to the propeller. Close behind the main wheel this shaft vanishes into a tube of some 5in diameter, and the latter may either provide a relatively rigid location for bearings for a small-diameter shaft or it may be a thin-wall tube which actually rotates and forms the drive.

As emphasized last week, the Puffin is not an official de Havilland Aircraft project, although the company have provided every assistance. Nearly all the club members work at DH, and it is doubtful if any other candidate for the Kremer prize (£5,000 for a flight of one mile over a figure-of-eight course, starting and finishing at not less than 10ft altitude) has been able to draw upon so much talent, research equipment and hardware. By the end of last week the Puffin had shown beyond doubt that it is stable and fully controllable, and that it can be sustained in level flight. An attempt on the Kremer prize appears to be imminent.



J. H. "Jimmy" Phillips, a de Havilland Aircraft test pilot (head emergent), with S. C. Caliendi, the club's treasurer, making adjustments. Club secretary is Mr E. C. Clear Hill, and the chairman is J. C. Wimpenny, DH Aircraft deputy chief aerodynamicist