

Fortunately tests had been carried out by the "National Advisory Committee for Aeronautics" of America with plain and split flap on NACA 23021. These tests appeared to show that provided the hinge gap was effectively closed, the results with plain flaps compared quite favorably with those obtained with split flaps of the same size, so the former were chosen, as they presented a simple proposition from the manufacturing point of view.

Another advantage of plain flaps was the probability of being able to use a small flap depression for quick take-off, a very important consideration with aero-towing, since for small deflections this type of flap gave an increase in lift for a negligible increase in drag. Other possible uses, which were suggested, were to use a small downward deflection for lowering the sinking speed at low speeds and a small upward deflection for the same purpose at high speeds. At this stage perhaps it is worth mentioning that the flaps were never intended for getting out of muddles in clouds.

New information on wing-fuselage junctions encouraged the use of a shoulder wing instead of a neck; the resulting low position of the wing rendering a gulled wing a practical necessity rather than a fashionable extravagance.

Stability was clearly a very important factor for cloud flying. In view of this, a fixed tailplane was fitted to the "King Kite" instead of the pendulum elevators on "Hjordis".

The conditions for which the "King Kite" was intended to be used made it essential for the pilot to be comfortable and to have a good view, and also to have easy exit with a parachute in an emergency. The necessary freedom was obtained by moving the dashboard further forward than was normal practice and enclosing the cockpit in a celluloid "greenhouse". The "greenhouse" conformed to the basic shape of the fuselage, this, though increasing the frontal area over that given by the conventional blister, had the advantage of giving a better streamlined shape and a rather less "made to measure" feeling about the cockpit.

The fuselage closely followed the "Kirby Kite" form except for a rather fatter nose, to give room for the large number of instruments required for blind flying.



The Slingsby "King Kite"

Wooden construction was used throughout; the bending load on the fuselage being taken by the longerons and torsional loads by the ply skin. The wing was of the single spar type, the spar located at .3 chord, taking bending, the torsional load being taken by the ply covering, which was carried back to the rear spar; the front and rear spar and the ply between them forming the drag bracing of the wing. It was necessary to put the ribs very close together in order to keep the shape of the section and develop the full stress in the thin ply covering. Nearly the whole trailing edge was taken up with either flaps or ailerons. The latter were covered with fabric and stiffened by diagonal ribs in order to avoid any tendency to flutter due to concentration of weight far from the hinge line.

Owing to the large torsional loads on the flaps these were covered with ply and operated by a cable mechanism and later by means of "Arens" controls.

How successfully the "King Kite" will discharge its duties in the soaring world remains to be seen, and at this stage it would be imprudent to say too much, but such test flying as has been done up to date seems to promise ample justification for the trouble and thought that preceded its design and manufacture.

