

No: 7/86

Ref: 3

Aircraft type and registration: Southdown Raven-X weight-shift microlight G-MNLO

No & Type of engines: One Rotax 447 Two Stroke Twin piston engine

Year of Manufacture: 1986

Date and time (GMT): 6 April 1986 at 1745 hrs

Location: Upottery Airfield, near Honiton, Devon

Type of flight: Test Flight

Persons on board: Crew — 1 Passengers — 1

Injuries: Crew — 1 (Serious) Passengers — 1 (Fatal)

Nature of damage: Trike unit destroyed, wing structure severely damaged.

Commander's Licence: Private Pilot's Licence (Group D)

Commander's Age: 20 years

Commander's Total Flying Experience: Approximately 300 hours (of which approximately 12 were on type)

Information Source: AIB Field Investigation.

The newly built aircraft was taken to Upottery Airfield for the required flight testing by the manufacturer's Agent prior to the issue of a full Permit to Fly. A qualified club instructor also went along to assist. The engine had been partly run-in by the new owner on the previous day and this was completed at the airfield prior to the first flight.

After his first flight the Agent reported that the aircraft had a tendency to turn to the right. Various adjustments were made to try to correct this bias, including adjusting the wing tip strut and re-profiling one of the battens on the right wing. These adjustments were made over a series of flights, probably five or six in total. The penultimate flight which was flown by the Agent, after the batten adjustment had been made, was reported to have been much better.

A squall of snow and soft hail then passed over the airfield and it was necessary to shelter for about twenty minutes while it blew over. After it had cleared it was reported that the instructor looked the aircraft over and, after strapping a passenger into the rear seat, started up and taxied over about twenty yards of grass to the runway. The instructor then stopped on the runway for one to two minutes before opening up the throttle for take-off. Eye witnesses described the take-off as being normal up to 100—200 feet when a sudden left bank of about 60 degrees was observed. The aircraft turned to the left, descended, and flew into the ground at a steep angle.

Upottery Airfield is situated on the top of a hill and has a steep ridge on its north east side just beyond the airfield boundary. The ridge, which is parallel to the north west/south east runway used for take-off that day, has a small valley across it abeam the accident site and pointing directly at it. The surface wind at the time of the accident was approximately 040°/15 knots (kt)

(almost at right angles to the runway) and would have tended to funnel along the valley before being lifted by the ridge itself. The meteorological office "aftercast" for the area gave the 500 feet wind as 040°/18 kt with gusts up to 27 kt. The overall effect would have been to accentuate the blustery airflow over the airfield. The surface temperature was between 0 and + 3°C and between heavy showers the weather was reported as clear and sunny.

The aircraft crashed into a flat medium hard arable field 100 metres south west of the runway, approximately opposite the runway mid-point. Impact heading was estimated at 280°M. Little other evidence was available from the site to indicate how the aircraft impacted the ground as it was removed and de-rigged and the ground marks were trodden in before AIB arrival.

Wreckage examination indicated that the trike unit impacted the ground with a high descent rate in a nose down attitude and with significant leftward drift. This resulted in severe break-up of the trike unit, although the engine and fuel tank were virtually undamaged. The evidence suggested that the propeller was turning at impact, but probably not at maximum speed. The nose and both tip leading edges of the wing had clearly contacted the ground but, in the absence of ground marks, it was not possible to ascertain the wing attitude at impact. The wing structure exhibited considerable deformation and the leading edge spars were fractured in a number of places, but the sail was little damaged.

All failures in the trike and wing were consistent with the effects of ground impact. However, the possibility that some of the failures could have occurred prior to impact could not be totally dismissed. Tip struts, which feed sail tension loads around each wing tip were found differentially adjusted, with the right strut extended 15 mm more than the left. This was in accordance with witness evidence that between the test flights the right strut was extended and the left strut shortened in an attempt to correct the right turn tendency. This direction of adjustment was in fact incorrect and the differential adjustment found would have promoted a tendency to turn to the right. However, the manufacturer considered that the effect would have been minor.

The fuel system was inspected and the engine was test run on the ground. No evidence of pre-impact malfunction or failure of the aircraft was found.

The weather conditions at the time of the accident were conducive to carburettor icing and the possibility of a loss of power for this reason after take-off could not be discounted. Aeronautical Information Circular 1/85 contains useful informal on this subject.

Before a newly delivered microlight may be flown by its new owner it first has to be assembled and test flown by the manufacturer's Agent in the field. On completion the Agent sends the Flight Test Report back to the manufacturer who in turn applies to the CAA for a full Permit to Fly for the new owner.

The Permit to Fly for this aircraft, dated 24 April 1986 and valid for two months, was issued by the CAA for the purpose of "Flight Testing for the issue of a Permit to Fly". The Conditions of this Permit included the statements: "The aircraft shall be operated only by the operator named on Page 1", and this was stated as being Southdown International Ltd. Limitations in the Permit included a clause that the seating, "shall be limited to one for flight test purposes".