

**Aviation Safety Investigation Report
198701462**

Ligeti Stratos

22 September 1987

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Occurrence Number: 198701462
Location: 1 km SE Penfield VIC
Date: 22 September 1987
Highest Injury Level: Fatal
Injuries:

Occurrence Type: Accident

Time: 1750

	Fatal	Serious	Minor	None
Crew	1	0	0	0
Ground	0	0	0	-
Passenger	0	0	0	0
Total	1	0	0	0

Aircraft Details: Ligeti Stratos
Registration: Not Registered
Serial Number: N/A
Operation Type: Sport Aviation (Test Flight)
Damage Level: Destroyed
Departure Point: Penfield VIC
Departure Time: 1730
Destination: Penfield VIC

Approved for Release: 17 June 1988

Circumstances:

This aircraft was intended to be the production version of the "Stratos" aircraft. The prototype version had successfully flown some 340 hours. The production model incorporated significant changes made by the designer/pilot. These changes included the removal of the dihedral from the main wing and the use of full span elevators on the canard wing and full span ailerons on the main wing. The engine mounting was lowered such that the ducted propeller was totally below the main wing and the lower part of the propeller duct was extended well forward to form a "channel or strake". The main purpose of the "channel wing" was an attempt by the designer to lower the stall speed of the aircraft to 30 knots and to reduce both landing and takeoff speeds and distances. As far as the investigation could determine, the effect of these modifications had not been checked by wind tunnel or other methods prior to this flight. On the day of the accident the pilot and his assistants had worked at the factory preparing the aircraft for testing. The preparation included a determination of the centre of gravity, although no record was kept of these calculations. Following these preparations the aircraft was loaded onto a trailer and taken to Penfield. The weather conditions at the time were fine, with light winds. The pilot subsequently carried out a series of taxiing tests, to establish the optimum position for the control column. He then conducted a take-off, and operated in the local area for about 17 minutes. Witnesses reported that the aircraft then carried out a very slow pass over the aerodrome at a height of between 400 and 500 feet above ground level. About one minute later it was seen to turn back towards the strip. However, shortly after the turn was completed, control of the aircraft was evidently lost. It is uncertain whether the aircraft suddenly pitched nose up or nose down, but all witnesses agreed that it then fell vertically while the nose swung in a pendulous motion. The aircraft struck the ground in an inverted attitude with little or no horizontal speed. An inspection of the aircraft found that all airframe components were essentially intact and there was no indication of any airframe or control failure prior to ground impact. The engine was test run and strip inspected and no fault could be found. No aerodynamic testing was carried out on the airframe to

determine the likely effect on performance of the various modifications made to this aircraft. However, given that the prototype appeared to suffer no adverse flying characteristics, it is possible that the modifications incorporated in the new aircraft had an adverse effect on the stall characteristics. Analysis of the modifications indicates that the most significant effect on the stall characteristics would have resulted from use of full span elevators on the canard wing. The use of full span elevators results in a relatively uniform loading of the canard as the elevator is deflected approaching the stall. The result is that the canard would be developing more lift, compared to the same wing without full span elevators, before the wing stalled and the stall would be sharper. Because the main wing is still producing lift at this stage the nose down pitch following the stall of the canard would be aggravated. It is considered likely that the accident sequence was initiated by a full canard stall followed by a rapid nose down pitch. Also, the altitude at which the flight was conducted would not have allowed the pilot time to make the necessary corrective control inputs following the stall before the aircraft impacted the ground.

Significant Factors:

The following factors were considered to be relevant to the development of the accident.

1. The pilot encountered unforeseen circumstances beyond his capabilities.
2. The aircraft was operated at too low an altitude, on a test flight, to enable recovery from any unexpected divergences from normal flight. Because the investigation was not able to positively determine all the reasons for the accident, the following possible factors are also considered appropriate.
 1. The pre-test flight preparation was inadequate in that no apparent attempt had been made to check the performance of the aircraft following the significant design changes made to the prototype prior to this flight.
 2. The pilot may have been suffering some fatigue following a full day preparing the aircraft for flight.