



AIRCRAFT ACCIDENT REPORT
OCCURRENCE NUMBER 99/466
KOLB TWINSTAR MK2
ZK-JGW
NEAR TE PUKE
28 FEBRUARY 1999

Glossary of abbreviations used in this report:

agl	above ground level
amsl	above mean sea level
ASI	air speed indicator
CAA	Civil Aviation Authority
CAR	Civil Aviation Rules
C of G	centre of gravity
E	east
ft	feet
IAS	indicated airspeed
km	kilometre(s)
m	metre(s)
mph	miles per hour
NZDT	New Zealand daylight time
OPM	Operations and Procedures Manual
PIC	pilot in command
RAANZ	Recreational Aircraft Association of New Zealand
UTC	coordinated universal time

AIRCRAFT ACCIDENT REPORT

OCCURRENCE No. 99/466

Aircraft type, serial number and registration:	Kolb Twinstar Mk 2, 2456, ZK-JGW
Number and type of engines:	One Rotax 503
Year of manufacture:	1996
Date and time:	28 February 1999, 1455 hours* (approx)
Location:	11 km south of Te Puke, Bay of Plenty Latitude: S 37° 52.6' Longitude: E 176° 18.9'
Type of flight:	Private
Persons on board:	Crew: 1 Passenger: 1
Injuries:	Crew: Fatal Passenger: Fatal
Nature of damage:	Aircraft destroyed by impact forces
Pilot-in-command's licence	RAANZ Novice Microlight Pilot Certificate
Pilot-in-command's age	36 years
Pilot-in-command's total flying experience:	40 hours, all on type.
Information sources:	Civil Aviation Authority field investigation
Investigator in Charge:	Mr S J Walker

* Times are NZDT (UTC + 13 hours)

Synopsis

The Civil Aviation Authority was notified of the accident at 1550 hours on Sunday 28 February. The Transport Accident Investigation Commission was also notified but declined to investigate. A CAA on-site investigation was commenced later the same day.

The pilot was on a local flight from his father's farm at Paengaroa and was seen circling over a relative's house south of Te Puke. The aircraft then made a low, slow, steep turn over an adjacent property. From the turn, the aircraft entered a vertical dive from which it did not recover before striking the ground. The pilot and passenger were fatally injured.

1. Factual information

1.1 History of the flight

- 1.1.1 At approximately 1400 hours on 28 February 1999, the pilot took off in ZK-JGW from the farm airstrip, where it was normally based. He had one passenger on board, and his intention was to visit a relative's property on Te Matai Road, some 13 km to the south-west.
- 1.1.2 At about 1445 hours a resident of Te Matai Road noticed the aircraft tracking south, parallel with the road, at an estimated 500 feet agl, descending.
- 1.1.3 A short time later, the pilot's uncle, who owns a farm approximately 2 km further south on Te Matai Road, also saw ZK-JGW tracking south parallel with the road. At this point the aircraft was low enough for him to recognise one of the occupants as his nephew, who waved to him from the right seat of the aircraft.
- 1.1.4 Another relative, who had some flying experience as a student pilot, heard an aircraft fly over her house on Te Matai Road. The engine noise was loud, which she attributed to the aircraft being low over the house. She was aware that the pilot had arranged to fly in for a visit over the weekend and land on an adjacent property. She went outside and saw the aircraft in a low, slow, steep turn to the right over the northern neighbour's property. As the aircraft continued in a right turn over Te Matai Road she observed the aircraft nose drop rapidly and the aircraft enter a steep vertical dive to the road.
- 1.1.5 A the neighbour saw ZK-JGW fly low over Te Matai Road from the east then disappear behind the orchard shelter belt between the two properties. He called for his companion to come out of the house by which time the aircraft had reappeared over their property. His companion, who has piloting experience, described the track of ZK-JGW as a slow, tight turn with a high angle of bank in an elliptical right orbit a little higher than that of the shelter belt. The shelter belts are topped at approximately 30 feet. The right-seat occupant was seen to be waving to the two people on the ground as the aircraft continued this orbit around the property. One of the neighbours described a "porpoising" motion of the aircraft in flight.
- 1.1.6 The two neighbours indicated that there was no change in the sound of the engine from when ZK-JGW first flew over Te Matai Road until it suddenly entered a

vertical dive over the road. The engine note then changed to what was described as a “screaming” sound followed by a loud “thud” as the aircraft impacted the ground.

1.1.7 The people nearest to the accident scene went to help the occupants and summon emergency services.

1.1.8 The accident occurred in daylight, at approximately 1455 hours NZDT, 11 km south of Te Puke, at an elevation of 250 feet. Grid reference 260-U15-640005, latitude S 37° 20', longitude E 176° 18'.

1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Other</i>
Fatal	1	1	0
Serious	0	0	0
Minor/None	0	0	0

1.3 Damage to aircraft

1.3.1 The aircraft was destroyed by impact forces.

1.4 Other damage

1.5 Nil

1.5 Personnel information

1.5.1 The pilot held a RAANZ Novice Pilot Certificate dated 1 September 1998 and a current Medical Certificate. The Novice Certificate permitted him to fly under dual instruction, and solo under the supervision of an instructor. Each solo flight required specific authorisation. The carriage of passengers was not permitted.

1.5.2 Up to 20 February 1999 the pilot had logged 39.3 hours flight experience in ZK-JGW. This total included 25 hours dual instruction. He had completed more than the 25 hours necessary for the Intermediate Pilot Certificate and had passed the written test, but had not yet passed a flight test for this certificate.

1.5.3 The pilot's training had been in accordance with the RAANZ flight training syllabus. The syllabus included instruction on steep turns. This training had been carried out at a height over 1000 ft agl.

1.5.4 The pilot had always occupied the left seat of the aircraft on solo or dual flights.

1.5.5 The pilot had not obtained his instructor's authorisation for any flights on the day of the accident.

1.5.6 The instructor was aware that the pilot had previously carried out unauthorised solo flights and flights carrying passengers. He had discussed this with the pilot.

1.6 Aircraft information

- 1.6.1 ZK-JGW was a three-axis Class 2 Microlight built in New Zealand in 1996. It was first registered on 22 May 1996 and following an initial survey carried out on 6 June 1996, the aircraft was issued with a non-terminating Airworthiness Certificate. It was maintained thereafter in accordance with relevant Civil Aviation Rules and RAANZ requirements.
- 1.6.2 ZK-JGW was fitted with a Rotax 503 twin-cylinder two-cycle engine and wooden pusher propeller sitting above the Ceconite 103 covered wing. There were two seats in the side-by-side configuration, with one central control stick and two sets of rudder pedals so the aircraft could be flown from either seat.
- 1.6.3 The pilot had recently purchased ZK-JGW from the local Microlight Club.
- 1.6.4 His instructor had flown approximately 40 hours in ZK-JGW, both solo and with students. He reported that ZK-JGW would not fly safely below 55 mph IAS with a 60 degree bank angle, where full power would be required to maintain this airspeed. This is similar to the manufacturer's published figures. Approaching the stall condition, the aircraft would exhibit a "porpoising" motion followed by the right wing losing lift first. The instructor indicated that it would require at least 20 seconds of full power to recover adequately from the pre-stall condition.
- 1.6.5 Up to 18 July 1998, which is the last entry in the Maintenance Logbook, the aircraft had accrued 82.7 flight hours.
- 1.6.6 The aircraft was fuelled with premium unleaded gasoline mixed with two-stroke oil at a ratio of 50:1.
- 1.6.7 There was no evidence to suggest that the aircraft weight or C of G was outside the manufacturer's specified limits.

1.7 Meteorological information

- 1.7.1 On the afternoon of 28 February 1999, an anticyclone was centred over the central Tasman Sea, giving settled weather and a light to moderate westerly airflow over the North Island. Observations at Tauranga Airport, the closest reporting station to the accident site, indicated surface winds of 10 to 13 knots from the south-west, with a maximum gust of 21 knots at 1400 hours.
- 1.7.2 The weather conditions reported by the witnesses were consistent with those reported at Tauranga.

1.8 Aids to navigation

- 1.9 Not applicable

1.9 Communications

1.9.1 JGW had been recently fitted with a Microair 720 aircraft radio.

1.10 Aerodrome Information

1.11 Not applicable

1.12 Flight recorders

1.13 Not applicable

1.12 Wreckage and impact information

1.12.1 The aircraft struck Te Matai Road in a steep nose-down attitude whilst in a right-hand spin. After impact the aircraft rebounded to an inverted position in a shallow ditch by the roadside.

1.12.2 Impact damage included demolition of the cockpit area and wing, and deformation of the tailboom.

1.12.3 The propeller had shattered throwing fragments up to 50 m from the main wreckage. The engine mounts were twisted in the opposite direction to the propeller rotation.

1.12.4 Fuel was seen to be leaking from the outlet of one of the two plastic tanks and one tank was later observed to be approximately one quarter full.

1.12.5 Examination of control runs at the site indicated pre-impact integrity.

1.12.6 No useful instrument indications were present.

1.12.7 The accident site was adjacent to a large paddock, which would have been suitable for a forced landing.

1.13 Medical and pathological information

1.13.1 Post mortem examination of the occupants concluded that death was due to multiple injuries consistent with high-energy impact.

1.13.2 Toxicological tests disclosed no evidence of alcohol, or medicinal or recreational drugs.

1.14 Fire

1.14.1 Fire did not occur.

1.15 Survival aspects

1.15.1 The accident was not survivable owing to the high decelerative forces involved. Combination lap and shoulder harness restrained the occupants but the cockpit construction meant that there was little crushable structure forward of the occupants. Any significant longitudinal impact in this type of aircraft usually results in the destruction of the cockpit area with consequential effects on the occupants.

1.16 Tests and research

1.16.1 Nil

1.17 Organisational and management information

1.17.1 Not applicable

1.18 Additional information

1.19 Not applicable

1.20 Useful or effective investigation techniques

1.21 Nil

2. Analysis

2.1 On the day of the accident it is apparent that the pilot breached the requirements of the CAR Part 91 and RAANZ:

- The instructor had not been made aware of the pilot's intentions to fly that day and therefore was unable to supervise the flight as required by the RAANZ OPM.
- The pilot was not certified to act as PIC of an aircraft carrying passengers.
- The pilot chose to fly below the published required minimum altitude of 500ft AGL.

2.2 The aircraft would have been flying downwind as it was banking in an easterly direction over the neighbour's property toward Te Matai Road. The pilot may have been distracted from monitoring his airspeed in the turn by waving to people on the ground. The pilot may have been aware of a higher groundspeed compared to that of the upwind leg although the airspeed would have decreased because of the downwind component. If the pilot was not aware of the drop in airspeed indicated on the ASI and continued the tight turn crosswind without increasing the power and airspeed, onset of stall would have been inevitable. This phenomenon is exacerbated the closer the turn is made to the ground and is explained in the RAANZ Microlight Flight Training Manual.

2.3 The witness observations indicated that the ZK-JGW had stalled due to insufficient airspeed whilst in a banked condition. There was insufficient altitude for successful recovery.

2.4 The possibility of an aircraft control malfunction was eliminated by on-site examination.


2.5 There was sufficient evidence that the engine was operating at or close to full power when it impacted with the ground.

3. Conclusions

- 3.1 The pilot was qualified for solo flight, however he was not certified to act as PIC of an aircraft carrying passengers.
- 3.2 The flight had not been authorised by the instructor.
- 3.3 The pilot was not adequately experienced to carry out the manoeuvre that was being attempted immediately prior to the accident.
- 3.4 The aircraft had a valid microlight flight permit and had been maintained in accordance with the relevant requirements.
- 3.5 No pre accident defect was found.
- 3.6 The most likely cause of the accident was inadequate handling of the aircraft whilst performing a hazardous manoeuvre that was beyond the capability of the PIC based on his level of qualification, training and experience.

4. Safety recommendation

- 4.1. It is recommended that the New Zealand microlight organisations ensure that all microlight instructors highlight to novice pilots the dangers of unsupervised novice flights, unauthorised low flying and unauthorised carriage of passengers.


ACTING

Michael G Hunt
Assistant Director Safety Investigation and Analysis