

Interim Factual Report 10-008: Cessna C152 ZK-JGB and Cessna C152 ZK-TOD,
mid-air collision, near Feilding, Manawatu, 26 July 2010

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Interim Factual Report

Aviation Inquiry 10-008: Cessna C152 ZK-JGB
and Cessna C152 ZK-TOD, mid-air collision, near
Feilding, Manawatu, 26 July 2010

Transport Accident Investigation Commission

About the Transport Accident Investigation Commission and this Report

The Transport Accident Investigation Commission (Commission) is an independent Crown entity responsible for inquiring into maritime, aviation and rail accidents and incidents for New Zealand, and co-ordinating and co-operating with other accident investigation organisations overseas. The principal purpose of its inquiries is to determine the circumstances and causes of the occurrence with a view to avoiding similar occurrences in the future. Its purpose is not to ascribe blame to any person or agency or to pursue (or to assist an agency to pursue) criminal, civil or regulatory action against a person or agency. The Commission carries out its purpose by informing members of the transport sector, both domestically and internationally, of the lessons that can be learnt from transport accidents and incidents.

It would not be appropriate then to use this interim factual report to pursue criminal, civil or regulatory action against any person or agency. The Transport Accident Investigation Commission Act 1990 makes this interim factual report inadmissible as evidence in any proceedings. A full report will be released on completion of the inquiry.

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Important notes

Nature of this report

This interim factual report is an example of a preliminary report referred to in section 9 of the Transport Accident Investigation Commission Act 1990. It is not a draft report prepared for comment but a completed report, which the Commission believes is necessary or appropriate in the interests of transport safety.

This interim factual report presents the facts and circumstances established up to this point in the Commission's inquiry, and contains no analysis, findings or recommendations. Any extrapolation of the information given in this report would be mere speculation.

Final report may include different information

The Commission intends completing a final report of the accident after it completes its inquiry. This report will contain an analysis of the facts of the accident, findings and recommendations. The information contained in the Commission's final report may differ from the information contained in this interim factual report.

Citations and referencing

Information derived from interviews during the Commission's inquiry into the occurrence are not cited in this interim factual report. Documents that would normally be accessible to industry participants only and not discoverable under the Official Information Act 1980 have been referenced as footnotes only. Other documents referred to during the Commission's inquiry that are publically available are cited.

Photographs, diagrams, pictures

Unless otherwise specified, photographs, diagrams and pictures included in this interim factual report are provided by, and owned by, the Commission.



Cessna C152 ZK-TOD
(Courtesy of Flight Training Manawatu)



Cessna C152 ZK-JGB
(Courtesy of Flight Training Manawatu)



Source: mapsof.net

Location of accident

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Glossary

standard overhead join	the normal procedure was for the aircraft to join overhead an aerodrome 500 feet above the circuit altitude. Once on the non-traffic side descend to circuit altitude and cross to join downwind. When the circuit has been identified all turns should be made in the same direction as the circuit.
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Data summary

Aircraft particulars

Aircraft registration:	ZK-JGB	ZK-TOD
Type and serial number:	Cessna C152, 15284346	Cessna C152, 15280723
Number and type of engines:	1 Lycoming O-235-L2C piston	1 Lycoming O-235-L2C piston
Year of manufacture:	1980	1977
Operator:	Flight Training Manawatu	Flight Training Manawatu
Type of flight:	solo training	dual training
Persons on board:	1	2
Pilot's licence:	no licence (student pilot)	commercial pilot licence (aeroplane)
Pilot's age:	21	27
Pilot's total flying experience:	74 hours (20 on type)	1566 hours (about 1210 on type)

Date and time 26 July 2010, 1527 NZST¹

Location near Feilding (Taonui) Aerodrome
latitude: 40° 14.2' south
longitude: 175° 53.9' east

Injuries nil 2 fatal

Damage major aircraft destroyed

¹ Times in this report are New Zealand Standard Time (UTC + 12 hours) and are expressed in the 24-hour mode.

1. Factual information

1.1. Narrative

- 1.1.1. Feilding Aerodrome was an uncontrolled aerodrome, but the movement of aircraft operating in and around it were visible and recorded on air traffic control radar, provided they were fitted with transponders² that were selected on. Those recordings were made available to the Commission and most of the following information on times, and aircraft position and height has been derived from those recordings.
- 1.1.2. On Monday 26 July 2010, student A was programmed for a training flight involving instruction on the 'overhead joining procedure'.³ The student met with her instructor and after conducting a pre-flight briefing prepared ZK-TOD, a Cessna 152 aeroplane, for the flight. The student and instructor took off from Feilding Aerodrome, known locally as Taonui Airfield, at about 1500.
- 1.1.3. Radar recordings showed that after takeoff from runway 28⁴, ZK-TOD was turned right and flown about 3 nautical miles (5.5 km) to the north of the aerodrome, before again turning right back towards the aerodrome. The instructor and student then flew 2 overhead joining procedures with a touch and go landing after each.⁵ A similar track was flown on each occasion.
- 1.1.4. Shortly before ZK-TOD completed the second touch and go landing, ZK-KTZ, a second Cessna C152 aircraft from the same training organisation, took off from runway 28. Shortly after take-off, the instructor onboard ZK-KTZ initiated a practise 'engine failure after take-off' exercise.
- 1.1.5. After climbing out from the engine failure exercise, ZK-KTZ flew about parallel with ZK-TOD as both aircraft departed to the north of the aerodrome. The instructor onboard ZK-KTZ reported that the 2 instructors spoke to each other on the common local area radio frequency of 124.1 megaHertz, to coordinate their flightpaths. ZK-KTZ was levelled at about 1200 feet and continued north, while ZK-TOD was observed to climb to about 1500 feet before turning left and return towards the aerodrome. About this time a broadcast was made from ZK-TOD advising other traffic that the aircraft was joining overhead the aerodrome from the north.
- 1.1.6. During this time an agricultural aircraft was conducting topdressing operations on a paddock adjacent to the northern boundary of the aerodrome. The agricultural aircraft was landing on runway 28 and, after loading, departing off runway 10 depending on other traffic. After ZK-KTZ and ZK-TOD had taken off, the agricultural aircraft landed and taxied to its loading point near the western end of the runway. A third Cessna C152 aircraft, ZK-JGB, also from the same flight training organisation as the first 2 aircraft and with one student onboard (student B), called lining up on runway 28. This was shortly followed by another transmission from student B advising ZK-JGB was taking off on runway 28.
- 1.1.7. At 1526:59, ZK-TOD was 3 nautical miles to the north-west of the aerodrome, near the eastern boundary of Feilding township, having just completed a left turn. The radar data showed the aircraft was now tracking directly towards the aerodrome, with a recorded altitude of 1300 feet, having descended from 1400 feet during the left turn (see Figure 1). At the same time, ZK-JGB had turned right onto a crosswind leg and was climbing through 900 feet. Student B was heard to have transmitted that ZK-JGB was crosswind and vacating to the training area to the north.

² An aircraft transponder transmits the aircraft's selected unique identification code and altitude in response to radar interrogation. Altitude readings have a tolerance of ± 200 feet.

³ See Glossary for simplified explanation of the procedure.

⁴ In a direction of 280 degrees magnetic

⁵ A touch and go landing involves the aircraft touching down or landing and power is then applied to commence the take off.

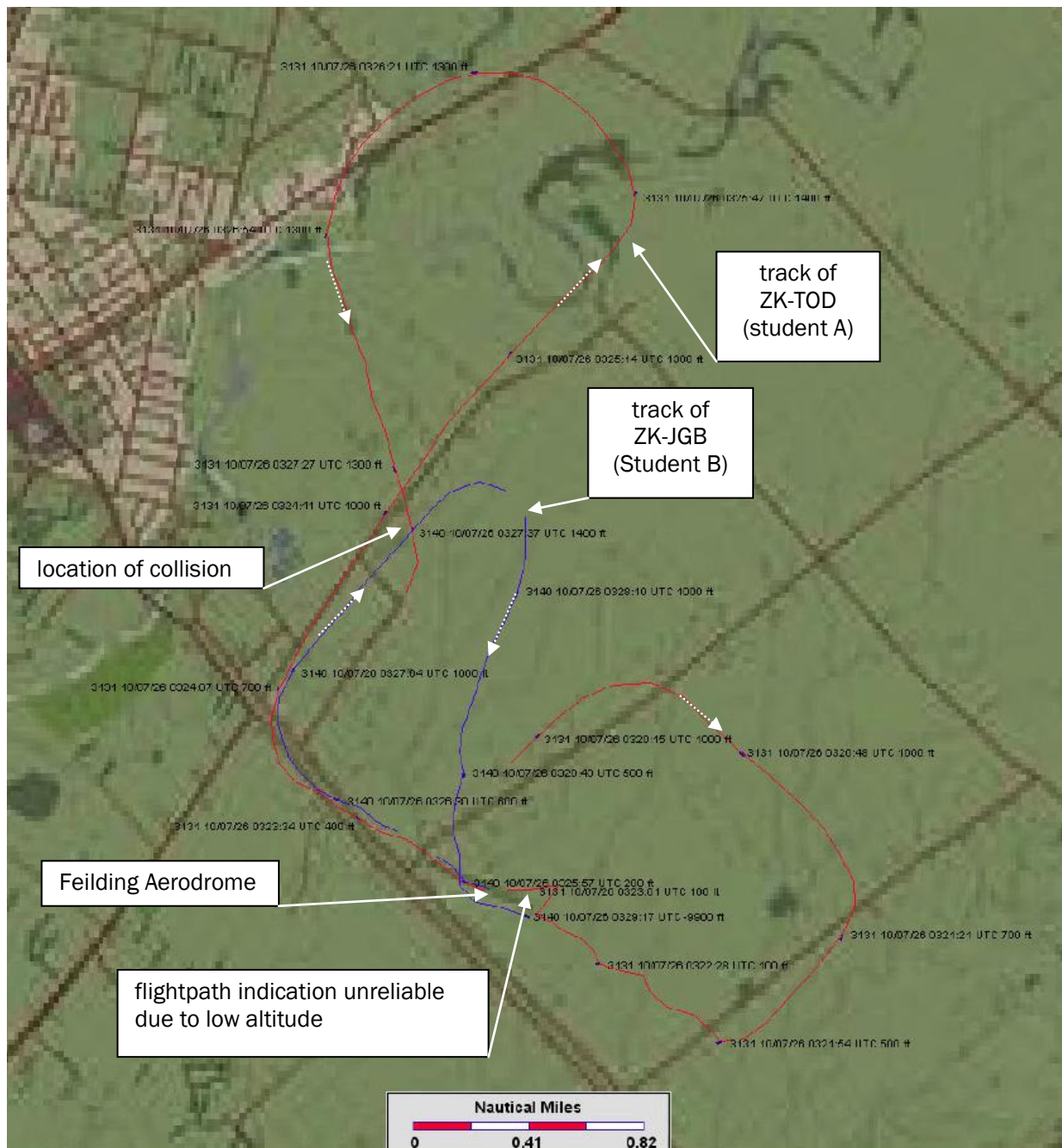


Figure 1
Radar Recording
(Courtesy of Airways New Zealand)

- 1.1.8. The radar recording showed ZK-TOD and ZK-JGB continued to maintain constant tracks as they closed on each other, with ZK-TOD maintaining 1300 feet and ZK-JGB climbing steadily. At 1527:36 the 2 aircraft collided. Student B later reported that he heard a loud noise and the aircraft nose then pulled down. The engine stopped soon after. ZK-TOD was seen to enter a steep descending spiral dive before impacting the ground, fatally injuring the 2 occupants. As a result of the collision the engine on ZK-JGB stopped. However, student B was able to glide back to the aerodrome and landed on the side of runway 10 with the nose wheel trailing rearwards. Student B was not injured.

1.2. Wreckage examination

- 1.2.1. ZK-TOD was destroyed in the ground impact. Impact marks on the leading edge of the right wing were consistent with having been struck by a tyre, with black rubber deposit on the surface of the indentation. Outer sections of the right wing, including the aileron, were found about 280m north of the main wreckage.

- 1.2.2. The fixed non-retractable nose wheel of ZK JGB had been forced rearward. The fuel line to the carburettor was broken, as well as the carburettor. This is considered the most likely reason for the engine stopping in flight.

1.3. Aerodrome information

- 1.3.1. Feilding Aerodrome was located 3 nautical miles to the south east of Feilding. It consisted of a single sealed runway surrounded by a grass verge. The runways were aligned 280/110° magnetic. Local procedures required aircraft to circuit to the north of the runway, resulting in runway 28 being a right-hand circuit and runway 10 left-hand.
- 1.3.2. The aerodrome was 214 feet above mean sea level, resulting in a normal circuit altitude of 1200 feet. Local procedures stated an initial overhead joining altitude of 1500 feet, due to this being the lower limit of controlled airspace above the aerodrome.
- 1.3.3. The overhead join was a common means of joining the aerodrome to land. Aircraft would join overhead the aerodrome at 500 feet above the circuit altitude before descending to join the circuit.

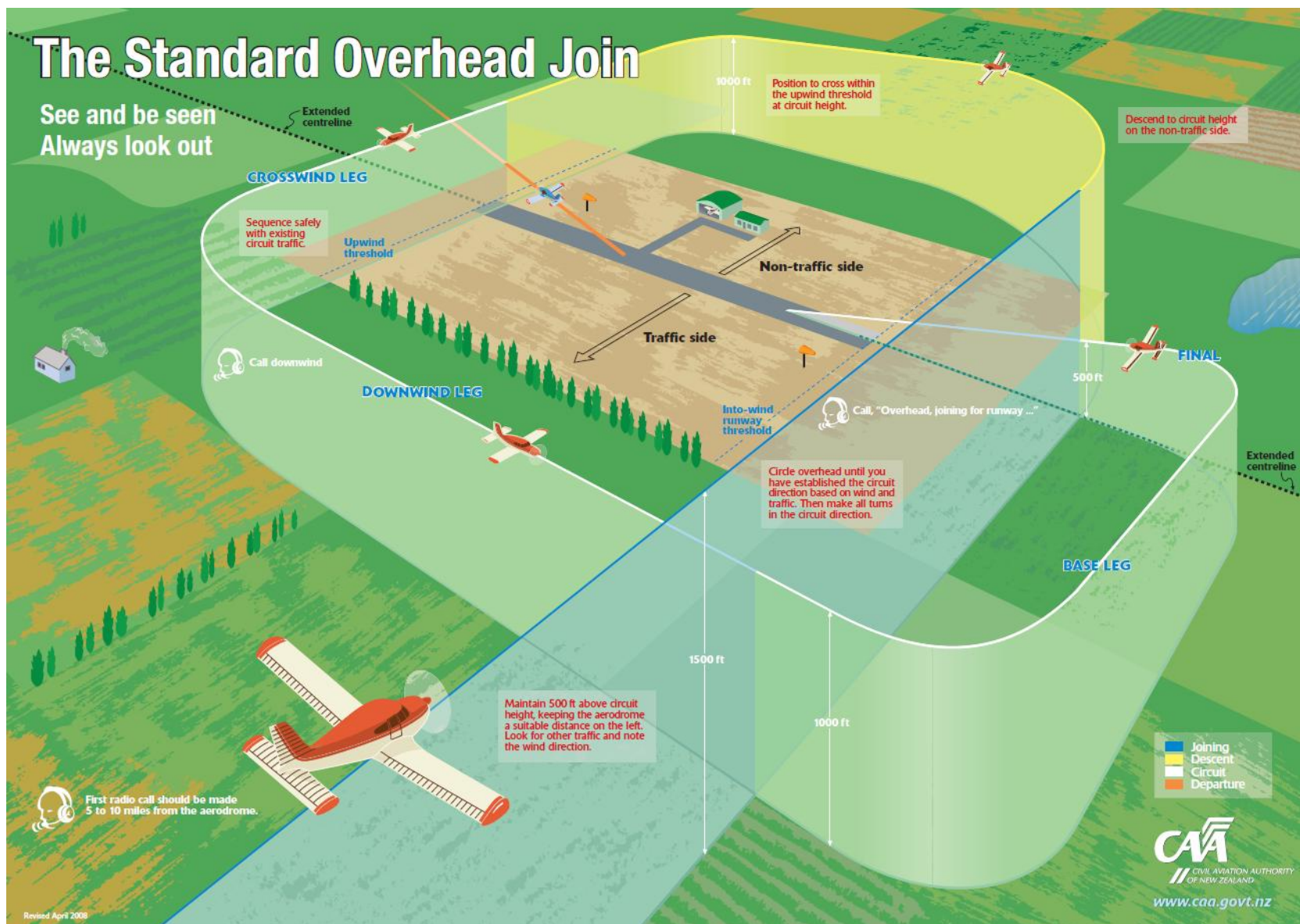


Figure 2
Standard overhead joining procedure
(Courtesy of the CAA)

1.4. History of mid-air collisions and near misses in New Zealand

- 1.4.1. On 8 February 2006, 2 aircraft collided near Shannon in the Manawatu, resulting in the deaths of both student pilots. On 17 February 2008, 2 aircraft collided overhead Paraparaumu Aerodrome resulting in the deaths of the 1 instructor and 2 student pilots. Like the earlier accident, both aircraft were engaged in flight training activities at the time of the collision. The Commission's investigation of the 2008 accident determined that the pilots of both aircraft had been following recognised procedures and had made radio transmissions at the appropriate time, but did not locate and avoid the other.⁶
- 1.4.2. Initial Civil Aviation Authority data showed that recorded pilot training hours have doubled in the last 15 years to nearly 300 000 hours per year. A review of the accident and incident data showed that the reported number of near misses has increased significantly in the last 5 years (see Figure 3). The increase in reported near misses involving training aircraft has been more pronounced. The total number of reported near misses for the period 1990 to 1999 was 17, with 3 of these involving training aircraft. For the period 2000 to date, the total number of reported near misses has increased to 131, while the number involving training has increased to 60.

	All Fatalities	Training Fatalities	All Collisions	Training Collisions	Near Misses	Training Near Misses
1990	1	0	2	0	0	0
1991	0	0	1	0	0	0
1992	1	0	1	0	0	0
1993	4	0	1	0	1	0
1994	0	0	0	0	1	0
1995	0	0	1	1	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	8	2
1998	0	0	0	0	5	1
1999	0	0	1	0	2	0
2000	0	0	0	0	7	2
2001	0	0	2	0	4	1
2002	0	0	0	0	7	3
2003	0	0	0	0	8	3
2004	0	0	0	0	6	4
2005	0	0	0	0	11	1
2006	2	2	1	1	9	5
2007	0	0	2	1	10	3
2008	3	3	1	1	26	18
2009	0	0	0	0	23	14
2010	2	2	1	1	20	6
1990-1999 Total	6	0	7	1	17	3
2000-2010 Total	7	7	7	4	131	60
Grand Total	13	7	14	5	148	63

Figure 3
Mid-air and near miss data
(data courtesy of New Zealand Civil Aviation Authority)

- 1.4.3. While the number of mid-air collisions has been steady over the last 2 10-year periods, the number of fatalities and collisions involving training aircraft has increased in the last 10 years.

⁶ Report 08-001, Cessna 152 ZK-ETY and Robinson R22 ZK-HGV, mid-air collision, Paraparaumu, 17 February 2008.

1.5. Further lines of inquiry

The Commission's current lines of inquiry includes, but is not limited to, the following:

- i. The inquiry has yet to establish if any malfunction in either aircraft could have contributed to the collision.
- ii. The standard of pilot training in New Zealand
- iii. The growing level of pilot training activity in New Zealand and the effect this might have on the level of air traffic services at uncontrolled aerodromes.
- iv. Analysis of the available data around midair collisions and training near misses.



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