Australian Government
Australian Transport Safety Bureau

Aircraft proximity event between an Alpha Aviation R2160, VH-NZT and a Diamond DA 40, VH-UNH

13 km NW of Bankstown Airport, NSW, 17 January 2013

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Aircraft proximity event between an Alpha Aviation R2160, VH-NZT and a Diamond DA 40, VH-UNH

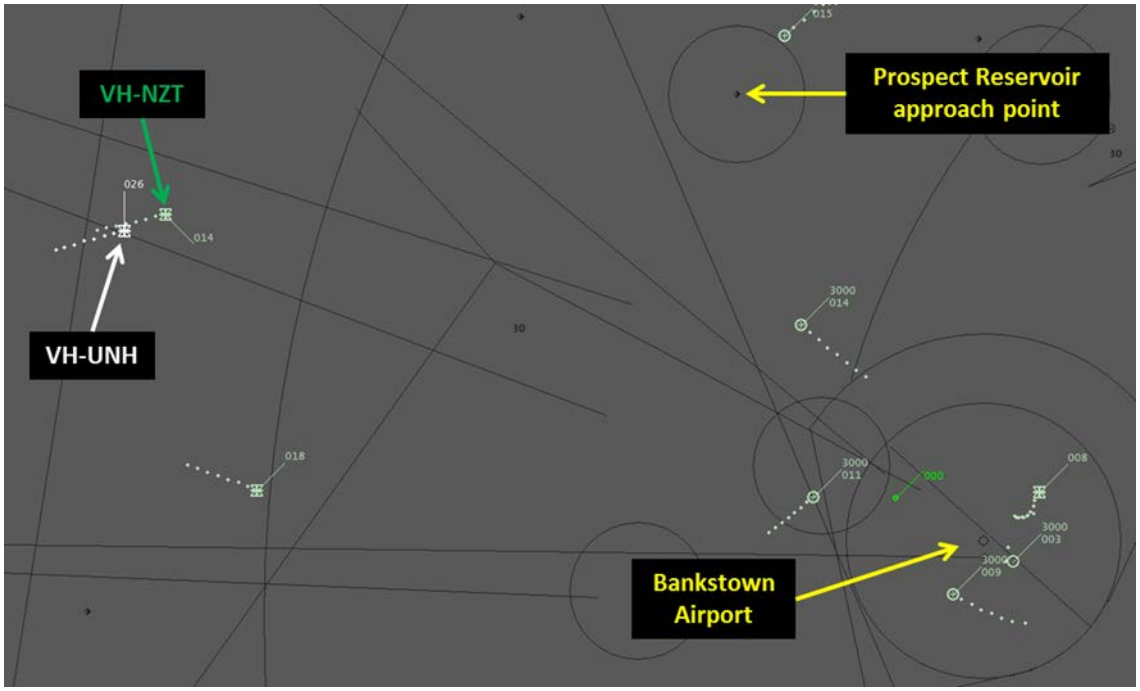
What happened

On 17 January 2013, the flight instructor and student pilot of an Alpha Aviation R2160 aircraft, registered VH-NZT (NZT), had completed a training flight in the local training area to the west of Bankstown, New South Wales. They were returning to Bankstown via the 'Prospect Reservoir' (Prospect) [1] visual flight rules (VFR) approach point, maintaining 1,500 ft. The Airservices Australia surveillance data showed NZT maintaining 1,400 ft. The pilot reported that the aircraft's altimeter was indicating 1,500 ft and that the transponder had since been corrected for the 100 ft discrepancy.

At the same time, the instructor and student of a Diamond DA 40 aircraft, registered VH-UNH (UNH), were also returning to Bankstown via Prospect after conducting flying training in the local training area. They had been operating between 2,500 and 3,500 ft and elected to conduct a shallow descent to arrive at Prospect maintaining 1,500 ft.

Airservices Australia surveillance data showed UNH following NZT on a similar track (Figure 1).

Figure 1: VH-NZT and VH-UNH tracking to Prospect Reservoir



Source: Underlying image sourced from Airservices Australia

Both UNH and NZT continued tracking for Prospect and when at 4-5 NM, the instructor of NZT changed radio frequency to Bankstown Tower. Shortly after, at 3.5 NM (1550:47 Eastern Daylight-saving Time[2]), UNH was observed on the Airservices Australia surveillance data descending overhead NZT with 600 ft recorded vertical separation, which was actually 500 ft, accounting for

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1 Prospect Reservoir reporting point is located at the north-eastern shore of the Reservoir, next to an open cut quarry.

2 Eastern Daylight-saving Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.

NZT's transponder discrepancy (Figure 2). The pilot of NZT reported maintaining 1,500 ft while UNH continued to descend.

At 1551:19, the surveillance data showed that there was 0.2 NM lateral and 300 ft vertical separation (200 ft actual) between UNH and NZT (Figure 3). After that time, for undetermined reasons, the altitude readout for NZT on the Airservices Australia surveillance data was temporarily corrupted and not recorded.

Figure 2: Aircraft positions at 1550:47

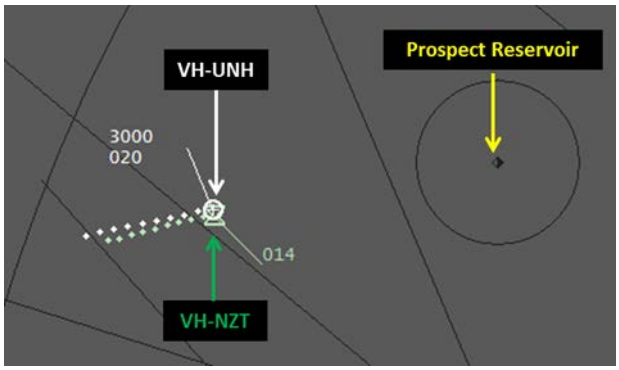
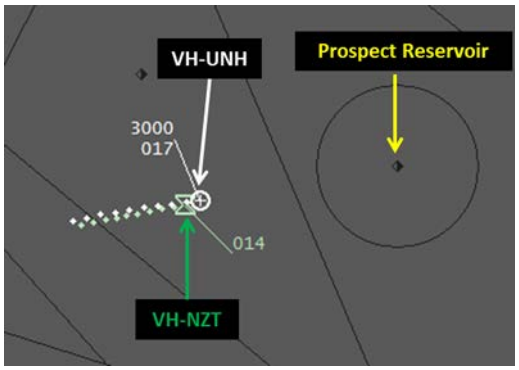


Figure 3: Aircraft positions at 1551:19



Source: Underlying image sourced from Airservices Australia

At 1551:37, when 2 NM from Prospect, the instructor of UNH changed to the Bankstown Tower frequency and heard a broadcast from NZT advising they were inbound from Prospect at 1,500 ft (Figure 4). At that time, UNH was also maintaining 1,500 ft. As the instructor and student were not aware of NZT, they immediately commenced looking for the aircraft.

At about the same time, NZT received circuit joining instructions from Bankstown Tower air traffic control (ATC). About 20-30 seconds later, the instructor reported sighting a 'flash' in his 10-11 o'clock[3] position and observed an aircraft (UNH) on descent, with about 30 m lateral separation. The instructor and student were not aware of UNH prior to that time.

Shortly after, the instructor contacted ATC advising that they nearly had a mid-air collision. Air traffic control replied that NZT was the only aircraft that had called at Prospect and the tower situational awareness display (TSAD)[4] showed two aircraft in that area, one to the north at 1,500 ft squawking Mode C[5] and a second not squawking Mode C. The instructor of UNH then observed NZT in his 3-4 o'clock position and appeared to be about 2 NM away and slightly lower.

NZT commenced the turn inbound to Bankstown (Figure 5). At the time of the incident, both NZT and UNH were operating in Class G airspace[6].

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[3] The clock code is used to denote the direction of an aircraft or surface feature relative to the current heading of the observer's aircraft, expressed in terms of position on an analogue clock face. Twelve o'clock is ahead while an aircraft observed abeam to the left would be said to be at 9 o'clock.

[4] TSAD: Surveillance data display, which assists Tower controllers to maintain situational awareness.

[5] Mode C: An aircraft transponder signal with barometric information from an encoding altimeter, encrypted so that it enables altitude presentation on air traffic control radar screens.

[6] Class G airspace is classified as non-controlled airspace. Instrument flight rules (IFR) and VFR flights do not require an airways clearance and ATC separation services are not provided.

Figure 4: Aircraft positions at 1551:37

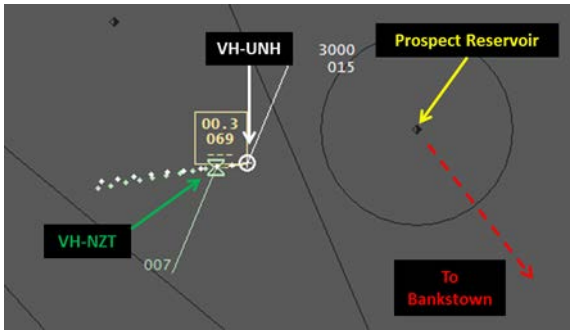
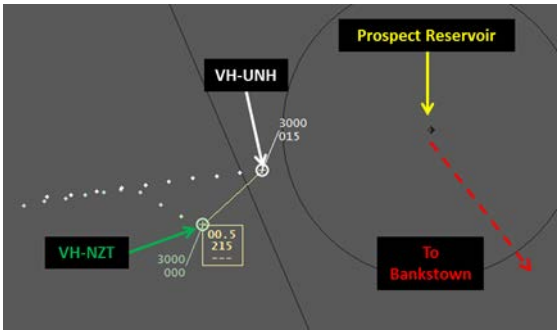


Figure 5: NZT turning inbound



Source: Underlying image sourced from Airservices Australia

At about 1552:39, the instructor of UNH broadcast his inbound call to Bankstown Tower and was advised by ATC of NZT ahead. The instructor replied that NZT was sighted. Both aircraft landed without further incident.

The instructor of UNH commented that NZT would have been obscured by the nose of the aircraft during the descent.

Safety message

All aircraft have blinds spots. Low-wing aircraft have blind spots below them that may obscure conflicting traffic when descending, while high-wing aircraft may block the view of the area you are turning into. Pilots should be aware of the visual restrictions of their aircraft and take the appropriate measures to clear the area around them, whether raising the wing of a high-wing aircraft to check for traffic prior to turning or making shallow S-turns when climbing or descending in any aircraft. This is particularly important when operating within the vicinity of high traffic density areas such as VFR approach points. While VFR approach points are not mandatory entry points into Class D[7] airspace, their use is recommended as they provide an orderly path for entering the circuit; assist with noise abatement; help keep aircraft out of nearby controlled airspace; and avoid the flow of outbound traffic. Consequently, when operating near VFR approach points, pilots need to remain vigilant and employ both alerted and unalerted see-and-avoid principles.

This incident highlights the importance of maintaining traffic clearance ahead and below, and for pilots to be mindful of aircraft blind spots.

The following publications and ATSB investigations provide information on collision avoidance and the human limitations of sighting aircraft:

- Collision avoidance strategies and tactics: www.aopa.org/asf/publications/sa15.pdf
- Collision avoidance – Methods to reduce the risk: https://easa.europa.eu/essi/egast/wp-content/uploads/2011/03/EGAST_Leaflet_Collision-Avoidance.pdf
- Mid-air collision - Cessna Aircraft 152, VH-FMG and Liberty Aerospace XL-2, VH-XLY, Casula NSW, 18 December 2008 www.atsb.gov.au/publications/investigation_reports/2008/aair/ao-2008-081.aspx
- Midair collision – Cessna Aircraft A150M, VH-UPY and Piper Aircraft PA-28-161, VH-CGT, 3 km NW of Moorabbin Airport, Vic, 27 August 2008 www.atsb.gov.au/publications/investigation_reports/2008/aair/ao-2008-059.aspx

[7] Class D: all aircraft must obtain an airways clearance and communicate with ATC. IFR aircraft are positively separated from other IFR aircraft and are provided with traffic information on all VFR aircraft. VFR aircraft are provided with traffic information on all other aircraft.

General details

Occurrence details

Primary occurrence type:	Aircraft proximity event	
Occurrence category:	Serious incident	
Location:	13 km NW of Bankstown Airport, New South Wales	
	Latitude: 33° 49.48' S	Longitude: 150° 54.92' E

Alpha Aviation R2160, VH-NZT

Manufacturer and model:	Alpha Aviation Design Ltd R2160	
Registration:	VH-NZT	
Type of operation:	Flying training - dual	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Diamond DA 40, VH-UNH

Manufacturer and model:	Diamond Aircraft Industries DA 40	
Registration:	VH-UNH	
Type of operation:	Flying training - dual	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.