

Australian Government Australian Transport Safety Bureau

Wheels up landing, involving a Nanchang CJ-6, VH-ALO

Barwon Heads Airport, Victoria on 6 February, 2016

ATSB Transport Safety Report Aviation Occurrence Investigation AO-2016-009 Final – 27 May 2016 Released in accordance with section 25 of the Transport Safety Investigation Act 2003

Publishing information

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Addendum

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Wheels up landing, involving a Nanchang CJ-6, VH-ALO

What happened

On 6 February 2016, at about 1250 Eastern Daylight Time (EDT), the pilot of a Nanchang CJ-6 aircraft, registered VH-ALO (ALO), was completing the first in a series of formation 'combat' joy flights booked for that day. The 'combat' flight, which consisted of a pilot and passenger on board each of two Nanchang aircraft (ALO and Number 2), had departed Barwon Heads airport, Victoria, about twenty-five minutes earlier. The pilot of ALO acted as the leader aircraft (or 'Number 1')¹ for the formation flight.

At the chosen 'break-point'² on upwind, Number 2 positioned ahead of ALO in the circuit. The two Nanchang aircraft remained in this single-file sequence behind a Pipistrel aircraft, which had joined the circuit on the downwind leg for runway 36. The Pipistrel aircraft landed, then rolled through to the end of the runway in order to exit; Number 2 followed suit. As ALO touched down, third in a close landing sequence, the pilot realised that they had not completed the pre-landing checks, and the landing gear had not been extended. The aircraft slid along the sealed runway, coming to a stop just off the centreline (Figure 1). The pilot and passenger were not injured, and were able to safely egress. The aircraft sustained damage to the propeller, engine and the underside of the fuselage.



Figure 1: Nanchang VH-ALO, on runway 36 after a wheels up landing

Source: Pilot

¹ In an echelon formation, number 1 (ALO in this instance) is the lead aircraft, and makes the decisions for the formation and also makes and responds to all radio communication for the formation; each individual pilot is still responsible for their own aircraft's safety.

² The position in the circuit, where the pilot in the lead aircraft (ALO) in the formation determines that the formation will manoeuvre into single file, usually with Number 1 in the lead.

Events leading to the wheels up landing

As the formation joined upwind, the pilot from a parachute aircraft operating at the airport, broadcast that tandem parachutists (student and instructor) had been dropped, and that this parachute aircraft was now conducting a second pass to drop the final student(s).





Source: En Route Supplement Australia entry for Barwon Heads; annotated by the ATSB

To avoid any issues for the novice parachute jumpers, and to prevent Number 2 from flying too close to the drop zone in the preferred echelon right,³ 'dead side'⁴ of the circuit join, the pilot in ALO made the decision that the formation would remain in the echelon left configuration and join over the top of runway 36. At the break point, Number 2 would move ahead, and both aircraft would conduct an early turn onto crosswind. This would keep both Nanchang aircraft well clear of the remaining parachute jumpers approaching the drop zone (Figure 2).

However, while the formation was still on upwind, the pilot of a smaller Pipistrel aircraft broadcast their intention to join the downwind leg for runway 36 (Figure 2), further delaying the Nanchang's turn onto crosswind. To maintain a reasonable separation from the Pipistrel, the two Nanchang pilots conducted a much wider crosswind leg, and resultant circuit, than normal.

The pilot in ALO continued to check for the remaining parachute jumpers, while broadcasting and responding to pertinent radio reports on behalf of the formation; and also managing the 'slowing down' of the formation. Once the Pipistrel has passed abeam the formation's position, and because the runway at Barwon Heads is too narrow to allow a formation landing, the pilot in ALO instructed the pilot in Number 2 to 'break'. The landing order became the Pipistrel, followed by Number 2 and then ALO.

The Pipistrel touched down, and took some time to roll through to the only available exit taxiway at the end of runway 36. The pilot in Number 2 requested the pilot in the Pipistrel to expedite the exit, as they wanted to land, but could not land until the Pipistrel was clear of the runway. The pilot in ALO reported keeping a close eye on proceedings in front of their aircraft. This included

³ An echelon formation is where the aircraft (usually military) are arranged diagonally. In a left echelon, each station (in this case Number 2) was stationed behind and to the left of the lead aircraft) ALO (adapted from Wikipedia definition).

⁴ The non-active side of the circuit.

sideslipping the aircraft to maintain a clear view of the runway movements as the Nanchang has limited vision over the nose at slow airspeeds.

Once Number 2 had landed and cleared the runway, the pilot in ALO reported flaring the aircraft in preparation for landing. It was not until the pilot heard the noise of the aircraft scraping the runway that they realised that the landing gear had not been extended.

Pilot experience and comment

The pilot had around 2,950 flying hours, with about 1,800 of these on Nanchang aircraft.

- The pilot reported that although feeling relatively fresh on the day, due to other demands, the previous week had been personally 'full on' and somewhat draining. This may have had played a small part in the oversight of the downwind and pre-landing checklists.
- With the combination of the parachute activities, the slower aircraft in the circuit, and the less than optimal echelon left formation configuration, the pilot in ALO reported their attention moved from their own aircraft into the Number 2 aircraft. Still maintaining the duties of Number 1 of the formation, but in the unusual 'behind' position, they had checked that Number 2's landing gear had been extended, and kept a close watch on the spacing of the three aircraft.
- The pilot reported the Nanchang is always a challenge to slow down until the landing gear is extended. The landing gear can be extended once the airspeed had reduced to 108 knots (usually during the downwind checks). The extension provides sufficient aerodynamic drag to reduce the airspeed closer to the desired approach speed.
- The pilot reported that it was more common for these combat flights to operate from Moorabbin Airport, where the wider runways allowed a formation landing.
- These events and conditions, combined with no landing gear warning system being fitted to these early military training aircraft, allowed the pilot's attention to remain distracted and the landing gear was not selected down.

Safety message

The combination of factors distracting the pilot's attention during the approach and landing led to the downwind and pre-landing checklists being overlooked. The lack of any landing gear warning system fitted to the aircraft, which would have alerted the pilot to the incorrect configuration, left no protection between the distraction and the final action.

According to an *Interruptions / distractions* briefing note by the Flight Safety Foundation, interruptions and distractions usually result from the following factors:

- flight crew-ATC, flight deck or flight crew-cabin crew communication
- head down work, and
- response to an abnormal condition or unexpected situation.

Further information is available at:

Flight Safety Foundation Approach-and-landing accident reduction <u>Briefing note 2-4</u>, Interruptions / distractions.

Research conducted by the ATSB identified 325 occurrences between 1997 and 2004, which involved distractions. Of these, 54 occurred during the landing phase of flight.

ATSB (2006). <u>Dangerous Distraction</u>: An examination of accidents and incidents involving pilot distraction in Australia between 1997 and 2004. (Research and Analysis report B2004/0324).

General details

Occurrence details

Date and time:	6 February 2016 – 1250 EDT		
Occurrence category:	Accident		
Primary occurrence type:	Wheels up landing		
Location:	Barwon Heads Airport, Victoria		
	Latitude 38° 15.48' S	Longitude: 144° 25.65' E	

Aircraft details

Manufacturer and model:	Nanchang Aircraft Manufacturing CJ-6		
Registration:	VH-ALO		
Serial number:	532002		
Type of operation:	Private – other (Warbird – Limited)		
Persons on board:	Crew - 1	Passengers - 1	
Injuries:	Crew - 0	Passengers - 0	
Damage to aircraft:	Substantial		

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB 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 operations involving the travelling public.

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. ATSB - AO-2016-009