Australian Government
Australian Transport Safety Bureau

Breakdown of separation - Beech 200, VH-FDD and Beech 350, DINGO 008

Near Cooktown, Queensland, 9 August 2012

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Aviation Occurrence Investigation
AO-2012-101
Final

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Breakdown of separation - Beech 200, VH-FDD and Beech 350, DINGO 008

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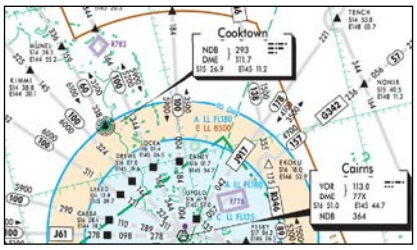
What happened

On 9 August 2012, a Raytheon Beech 350 aircraft, operating under the callsign DINGO 008, was conducting a military flight from Northern Peninsula Aerodrome, Queensland to Townsville, Queensland, under the Instrument Flight Rules (IFR)[1]. The aircraft was flight planned to track south, overhead Cooktown and Cairns, at flight level (FL)[2] 270.

Location of airspace



Source: Airservices Australia

At 1205 Eastern Standard Time[3], a Raytheon Beech 200 aircraft, registered VH-FDD (FDD) and operating under the callsign FLYDOC 423, departed Cairns, tracking north for Horn Island, Queensland, on climb to FL260. Due to other aircraft inbound to Cairns from the north, air traffic control (ATC) vectored FDD right of the aircraft's flight planned track. About 15 minutes later, enroute ATC cleared FDD to track direct to position KIMMI[4], to rejoin the aircraft's flight planned route.

At 1231:22, as FDD was passing FL255, the pilot requested further climb to FL300. The air traffic controller advised the pilot to stand by then commenced the required coordination with the two northern ATC sectors and the associated inputs into the Australian Advanced Air Traffic System (TAAATS). At 1232:15, the controller assigned FDD further climb, which resulted in a loss of separation assurance (LOSA)[5] with DINGO 008. At that time, FDD was passing FL259 and was 28.2 NM (52.2 km) south of DINGO 008, maintaining FL270 (Figure 1). There was about 2.8 NM (5.2 km) between the projected flight paths of the aircraft.

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1 Instrument flight rules (IFR) permit an aircraft to operate in instrument meteorological conditions (IMC), which have much lower weather minimums than visual flight rules. Procedures and training are significantly more complex as a pilot must demonstrate competency in IMC conditions, while controlling the aircraft solely by reference to instruments. IFR-capable aircraft have greater equipment and maintenance requirements.

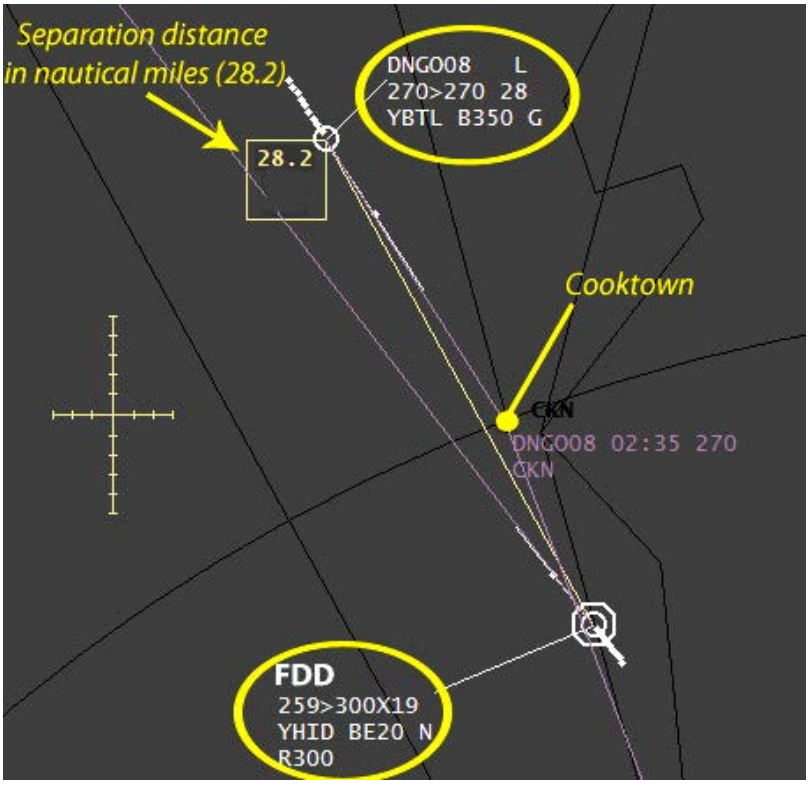
2 At altitudes above 10,000 ft in Australia, an aircraft's height above mean sea level is referred to as a flight level (FL). FL 270 equates to 27,000 ft.

3 Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

4 KIMMI was an Instrument Flight Rules waypoint.

5 A separation standard existed; however, planned separation was not provided or separation was inappropriately or inadequately planned. See also 'ATSB comment' section.

Figure 1: Proximity of the aircraft at 1232:15

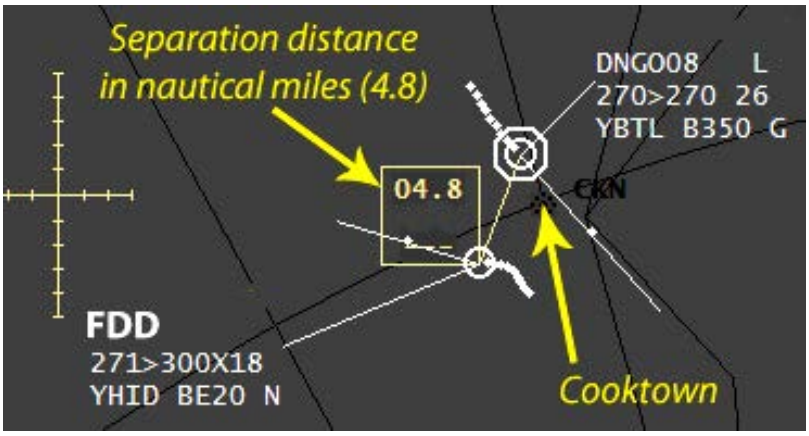


Note: Each graduation on the scale marker is 1 NM (1.85 km)
Source: *Airservices Australia*

At about 1232:30, the TAAATS Short Term Conflict Alert (STCA) activated on the controller's console. There was 10.1 NM (18.7 km) horizontally and 200 ft vertically between FDD and DINGO 008. The controller immediately issued the flight crew of FDD with a traffic alert, including the position of the other aircraft and an instruction to turn left onto a heading of 270°, which was acknowledged. The controller then issued a traffic alert to the flight crew of DINGO 008, with the position of FDD and an instruction to turn left onto a heading of 090°, which was acknowledged.

At 1235:25, a breakdown of separation occurred as the distance between the aircraft reduced to 4.9 NM (9.1 km) with both aircraft at FL270. The distance reduced further to 4.8 NM (8.9 km) with FDD 100 ft above DINGO 008 (Figure 2), before increasing three seconds later to the required radar separation standard of 5 NM (9.2 km) horizontally or 1,000 ft vertically.

Figure 2: Proximity of the aircraft at 1235:27



Note: Each graduation on the scale marker is 1 NM (1.85 km)
Source: *Airservices Australia*

The pilot of FDD subsequently reported to the controller that they had sighted and passed DINGO 008. The aircraft involved were both equipped with Airborne Collision Avoidance Systems (ACAS)[6] and no ACAS alerts were generated. The flight crew of FDD later reported that they had sighted the other aircraft on their ACAS, after the controller issued the clearance to climb to FL300, and had visual contact when DINGO 008 passed them. The flight crew of DINGO 008 reported that they sighted FDD on their ACAS and were visually able to identify the traffic to ensure that there was no imminent collision risk.

Air traffic control

The air traffic controller involved in the occurrence had about 23 years experience in ATC, with all of their control experience incorporating the airspace sector on which the incident occurred. On the day of the occurrence, the controller was working a 0600 to 1430 shift, which was the last morning shift in a series of three, before two rostered days off. The controller reported that they were fatigued but considered themselves fit for duty. The loss of separation event was about 15 minutes after the controller had returned from a rest break and around two hours before the shift finished.

The controller reported that prior to the level change request from FDD's pilot, the workload had been high with a moderate degree of complexity, then reduced. The controller was trying to expedite the process required to get clearance for FDD to climb to the amended level, so the pilot would not have to level the aircraft at FL260. In doing so, the controller stated that their attention narrowed to that task. When they assigned further climb to FDD, they had not identified the potential conflict with the other aircraft. The controller's attention was then diverted with other tasks and they did not have an opportunity to reassess the separation between FDD and DINGO 008 before the STCA alerted them to the conflict. The controller reported that they were then surprised at the slow climb rate of FDD.

The controller had completed compromised separation recovery (CSR) refresher training a few months prior to the occurrence. The controller considered that their reaction to the STCA and subsequent safety alerts and control instructions were a result of CSR refresher training and ATC experience.

ATSB comment

When the controller assigned FDD further climb to FL300, there was a LOSA with DINGO 008, as the controller had not identified the confliction and therefore had not ensured that the required standards of either vertical separation of 1,000 ft or radar separation of 5 NM (9.2 km) would be maintained. To assure separation, the controller would have had to issue instructions to ensure that FDD was at or above FL280 before the distance from DINGO 008 reduced below 5 NM or that the tracks of the aircraft were separated by 5 NM.

In this occurrence, a critical system defence (the STCA) activated and alerted the controller to the LOSA situation. The compromised separation recovery techniques utilised by the controller were applied quickly and were an effective defence in limiting the severity of the breakdown of separation.

Safety message

This incident highlights the importance for controllers to effectively balance their professional desire to promptly facilitate pilot requests with the overriding requirement to provide a safe and efficient air traffic control service.

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[6] An Airborne Collision Avoidance System (ACAS) is an aircraft system that warns of the presence of other aircraft that present a threat of collision.

The prompt and effective controller reaction to re-establish the appropriate separation standard highlights the benefit of and importance of regular compromised separation recovery training as an integral defence.

Aircraft details

Manufacturer and model:	VH-FDD: Raytheon Aircraft Company BE20 DINGO 008: Raytheon Aircraft Company B350	
Registration:	VH-FDD Unknown	
Type of operation:	VH-FDD: Aerial work DINGO 008: Military	
Location:	3.5 NM (6.5 km) south west of Cooktown, Queensland	
Occurrence type:	Breakdown of separation	
Persons on board:	VH-FDD: Crew – 2 DINGO 008: Crew - 2	VH-FDD: Passengers – 1 DINGO 008: Passengers - 4
Injuries:	Crew – Nil	Passengers – Nil
Damage:	None	

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.