Australian Government
Australian Transport Safety Bureau

# Separation issue involving a Pacific Aerospace CT/4B, VH-YCU, and a Diamond DA 40, VH-UNV

near Quirindi, New South Wales, 4 June 2015

**ATSB Transport Safety Report**
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**Addendum**

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# Separation issue involving a Pacific Aerospace CT/4B, VH-YCU, and a Diamond DA 40, VH-UNV

## What happened

Early in the afternoon on 4 June 2015, a Pacific Aerospace CT/4B, registered VH-YCU (YCU), was conducting an instrument training flight in the training area to the south-west of Tamworth, New South Wales, with an instructor and student on board. At the same time, a Diamond DA 40, registered VH-UNV (UNV), departed Tamworth on a visual navigation student assessment flight, bound for Bankstown, New South Wales, also with an instructor and student on board. Both aircraft were operating under the visual flight rules,[1] and the weather conditions were fine and clear.

As part of the training sequence, the instructor in YCU directed the student to intercept the 360 degree bearing from the Quirindi non-directional beacon (NDB)[2] The instructor further directed the student to track inbound to the Quirindi NDB at 4,500 ft[3] on that bearing (Figure 1), and carry out a Quirindi NDB-A approach.

When about 10 NM north of Quirindi, the student in YCU broadcast their position and intentions on the Quirindi Common Traffic Advisory Frequency (CTAF).[4] The pilot of a recreational aircraft responded to the effect that they were operating in the circuit area at Quirindi. There was no response from any other aircraft. When about 5 NM from Quirindi, the student in YCU made another broadcast on the CTAF, indicating their intention to enter a holding pattern from overhead the NDB, in preparation for the NDB-A approach. There was no response from any other aircraft to that broadcast.

At about the same time, UNV was tracking from Gate South (a reporting point south-west of Tamworth) towards Quirindi, also at 4,500 ft (Figure 1). The crew of UNV planned to overfly Quirindi then turn to the south-east and track towards Scone. The crew of UNV were monitoring the area VHF,[5] but not the Quirindi CTAF. As such, the crew of UNV did not hear the CTAF broadcasts made by the student in YCU. Even though the crew of both aircraft were monitoring the area VHF, neither had made any broadcasts on that frequency, so neither crew was aware of the other aircraft. At the time, both were tracking towards Quirindi at the same altitude.

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1 Visual flight rules are a set of regulations, which allow a pilot to only operate an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going.

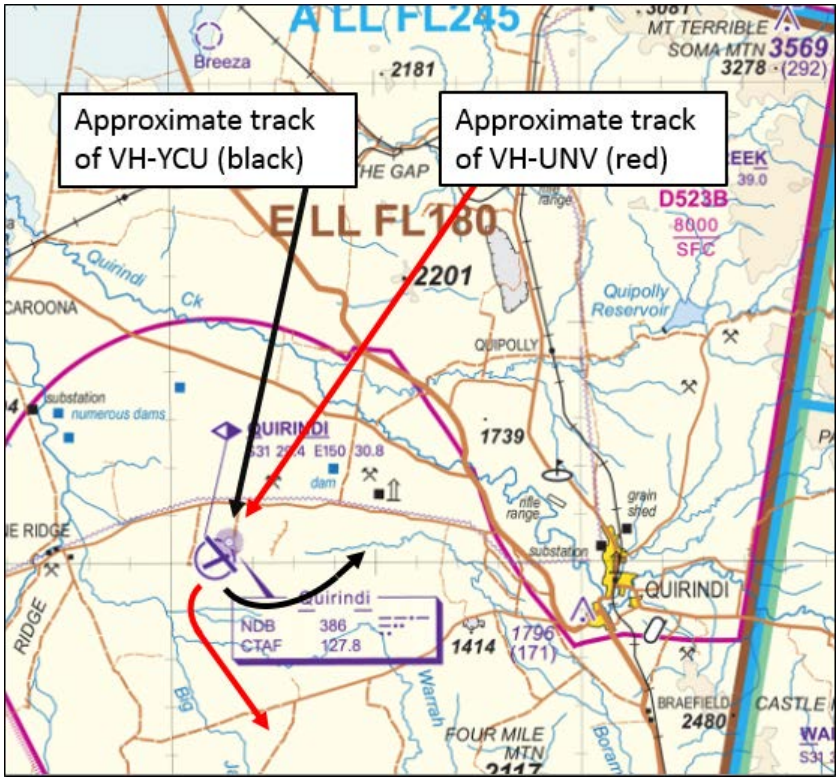
2 An NDB is a radio transmitter used as an aid to navigation. The signal does not include inherent directional information.

3 4,500 ft above mean sea level is about 3,450 ft above ground level overhead Quirindi aerodrome.

4 The CTAF is the frequency on which pilots operating at a non-controlled aerodrome should make positional radio broadcasts.

5 Area VHF (very high frequency) is the appropriate flight information area frequency for a location.

**Figure 1: Extract from a visual chart showing the manner in which the tracks of the two aircraft converged as they neared Quirindi, and the general direction of flight of each aircraft after they passed Quirindi (YCU turning to the north-east and UNV turning to the south-east)**




**Source: Airservices Australia, additions by the ATSB**

Just north of Quirindi, the traffic collision avoidance device fitted to YCU alerted the crew to an aircraft in their vicinity, at a distance of 0.4 NM, at the same altitude. The instructor commenced an intensified lookout and soon sighted UNV. At that moment, UNV was in about the 10 o'clock position[6] relative to YCU, at the same altitude, on a slightly converging flight path. The instructor in YCU estimated that at the time UNV was sighted, YCU was in approximately the 4 o'clock position relative to UNV.

Although there was no immediate risk of a collision, the instructor in YCU took control of the aircraft from the student and made a heading adjustment through about 20 degrees to the right. On the new heading, the instructor was satisfied that the flight path of the two aircraft would diverge. In recalling the incident, the instructor in YCU estimated that, at their closest point, the separation between the two aircraft was about 60 m laterally, at the same altitude.

After sighting UNV, the instructor in YCU attempted to establish contact with the crew of UNV on the Quirindi CTAF. The pilot of the recreational aircraft operating at Quirindi responded, but there was no response from the crew of UNV.

Still unaware of the proximity of YCU, the crew of UNV passed over Quirindi then turned to the south-east towards Scone, and commenced a climb to 5,500 ft. As they climbed, the instructor in UNV sighted YCU behind and beneath them, in about their 8 o'clock position. By that time, the crew in YCU had also passed Quirindi, and were now turning towards the north-east for the NDB-A holding pattern. Having sighted YCU, the instructor in UNV was satisfied that the two aircraft were on divergent headings and vertical separation was increasing as UNV climbed.

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[6] 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 a position of 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.

Following the separation issue, the instructor in YCU called air traffic control (Brisbane Centre) on the area VHF in an attempt to establish communications with the crew of UNV. The crew of UNV, who were still monitoring the area VHF, intercepted that call and responded. The crew of UNV then selected the Quirindi CTAF on one of their radios, and they had a brief discussion on that frequency. By the time communications were established on the CTAF, UNV was nearing 5,500 ft on a south-easterly heading towards Scone. The crew of YCU were resuming their planned exercise, entering the Quirindi NDB-A holding pattern.

### *Instructor comments - YCU*

The instructor in YCU made a number of comments regarding the incident, including:

***Use of radios.*** YCU was fitted with two VHF radios. During operations in the training area, the crew were monitoring the area VHF on one radio, and company operations on the other. The radio that was being used to monitor the company operations frequency, was switched to the Quirindi CTAF as they prepared for their NDB-A approach at Quirindi. As such, the crew were monitoring the area VHF and Quirindi CTAF at the time of the incident.

***Instrument flight training hood.*** The student in YCU was wearing an instrument flight training hood. The hood projected forward from the student's helmet in a manner that denied the student external visual reference, but allowed the student to scan cockpit instruments (to simulate instrument meteorological conditions). Under these circumstances, the instructor maintained a lookout for other aircraft and hazards, but the position of the student's helmet and hood was such that the instructor's visibility to the left of the aircraft was partially obscured. With that in mind, when alerted to other traffic in the vicinity, the instructor targeted a lookout to the left of the aircraft, past the student's helmet and hood. During this targeted lookout, the instructor sighted UNV. When the instructor sighted UNV, the aircraft was remaining on a constant line of sight relative to YCU, in approximately the 10 o'clock position.

***Density of training operations at Quirindi and Gunnedah.*** The instructor in YCU noted that even though Quirindi and Gunnedah are often used for flight training purposes, there is nothing in the En route Supplement Australia (ERSA) to alert pilots accordingly.

### *Instructor comments - UNV*

The instructor in UNV made a number of comments regarding the incident, including:

***Use of radios.*** UNV was fitted with two VHF radios. The instructor commented that depending on the circumstances, either radio could be used to monitor and broadcast on relevant CTAFs. At the time of this incident, the crew were monitoring the area VHF with one radio, and the company operations frequency on the other.

***Monitoring the CTAF.*** The instructor in UNV was aware that the student in UNV was not monitoring the Quirindi CTAF as they approached from the north, even though it was normal practise to monitor a CTAF under these circumstances (overflying an aerodrome). On this occasion, the instructor elected not to prompt the student to monitor the CTAF in order to reinforce a teaching point to the student regarding frequency management. The instructor was satisfied that a visual lookout would suffice under the circumstances – the conditions were fine and clear, and there were no broadcasts or other transmissions on the area VHF to suggest that there was any potentially conflicting traffic in their area.

## ATSB comment

The separation issue in this case may have been avoided if the pilots of the two aircraft involved had been monitoring and broadcasting on the same frequency. Both crews were monitoring the area VHF, but operating under the visual flight rules, there was no specific requirement for the crew of either aircraft to make a broadcast on that frequency. The crew of YCU broadcast their position and intentions on the Quirindi CTAF, but the crew of UNV were not monitoring that frequency.

The requirement to monitor a CTAF is subject to a level of interpretation, particularly with respect to the altitude above an airfield at which the requirement applies. The Aeronautical Information Package (AIP) requires a pilot to broadcast on the CTAF when he/she enters the vicinity of a non-controlled aerodrome. AIP goes on to describe the vicinity of a non-controlled aerodrome as being:

> …within 10 nm of the aerodrome and at a height above the aerodrome that could result in conflict with operations at the aerodrome.

Existing forums and processes (managed by CASA and Airservices Australia) allow airspace users to influence the manner in which airspace is managed and propose changes to relevant documents (such as the En Route Supplement Australia). Where changes have the potential to improve safety, operators are encouraged to present proposals for consideration, using those forums and processes. One relevant forum for proposing airspace-related safety improvements is the CASA Regional Airspace and Procedures Advisory Committee.

## Safety message

Pilots are encouraged to 'err on the side of caution' when considering when to make broadcasts and whether specific frequencies should be monitored, particularly noting the fundamental importance of communication in the effective application of the principles of see-and-avoid. An ATSB report titled *Limitations of the See-and-Avoid Principle* outlines the major factors that limit the effectiveness of un-alerted see-and avoid.

The ATSB SafetyWatch programme highlights broad safety concerns that emerge from investigations and occurrence data reported to the ATSB by industry. One safety concern relates to operations around non-controlled aerodromes. The ATSB safety watch website page, *Safety around non-controlled aerodromes,* includes the following relevant comments:

> Insufficient communication between pilots operating in the same area is the most common cause of safety incidents near non-controlled aerodromes.
>
> A search for other traffic is eight times more effective when a radio is used in combination with a visual lookout than when no radio is used.

The CASA booklet titled *Operations at non-controlled aerodromes* provides guidance with respect to the limitations of the see-and-avoid principle and relevant radio procedures. Civil Aviation Advisory Publication 166-1 also provides relevant guidance with respect to CTAF procedures.

## General details

### *Occurrence details*

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|---|---|---|
| Date and time: | 4 June 2015 – 1420 EST | |
| Occurrence category: | Incident | |
| Primary occurrence type: | Separation issue | |
| Location: | Near Quirindi, New South Wales | |
| | Latitude: 31° 29.92' S | Longitude: 150° 31.08' E |

### *Aircraft details – VH-YCU*

| | | |
|---|---|---|
| Manufacturer and model: | Pacific Aerospace Corporation CT/4B | |
| Registration: | VH-YCU | |
| Serial number: | 079 | |
| Type of operation: | Flying training | |
| Persons on board: | Crew – 2 | Passengers – Nil |
| Injuries: | Crew – Nil | Passengers – Nil |
| Damage: | None | |

### *Aircraft details – VH-UNV*

| | | |
|---|---|---|
| Manufacturer and model: | Diamond Aircraft Industries DA 40 | |
| Registration: | VH-UNV | |
| Serial number: | 40.1077 | |
| Type of operation: | Flying training | |
| Persons on board: | Crew – 2 | Passengers – Nil |
| Injuries: | Crew – Nil | Passengers – Nil |
| Damage: | None | |

## 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 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.