



Australian Government

Australian Transport Safety Bureau

Near collision involving Pacific Aerospace CT4, VH-YCO, and Piper PA-28, VH-WJZ

24 km NW of Gunnedah Airport, New South Wales, 15 April 2016

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Addendum

| Page | Change | Date |
|------|--------|------|
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Near collision involving Pacific Aerospace CT4, VH-YCO, and Piper PA-28, VH-WJZ

What happened

On 15 April 2016, the instructor and student of a Pacific Aerospace CT/4B aircraft, registered VH-YCO (YCO), conducted a dual (military) training flight under the instrument flight rules.¹ The aircraft departed from Tamworth Airport, and tracked to Narrabri Airport, before commencing the area navigation (RNAV) runway 11 approach to Gunnedah Airport, all in New South Wales.

Prior to commencing the approach, the instructor of YCO contacted the military radar controller (see *Military radar control*), who advised that they were not aware of any other aircraft in the area. The instructor reported that they broadcast on the Gunnedah common traffic advisory frequency (CTAF), when 18 NM from the aerodrome, advising that they were going to conduct the RNAV runway 11 approach, and stating their estimated time at the airport (Figure 1). The crew reported hearing a voice-back response from the aerodrome frequency response unit,² indicating that no one else had transmitted on the CTAF in the previous 5 minutes, and no response from any other aircraft on the CTAF.

At that time, an instructor and student pilot of a Piper PA-28-181 aircraft, registered VH-WJZ (WJZ), were conducting a local dual training flight from Gunnedah Airport. The instructor reported that they were broadcasting on and monitoring the CTAF.

At about 1450 Eastern Standard Time (EST), YCO was 13 NM north-west of Gunnedah on the RNAV approach for runway 11, and at 4,500 ft above mean sea level (AMSL), when they were alerted by the aircraft's traffic collision avoidance device³ of another aircraft. The device indicated that the other aircraft was 200 ft below them and 2 NM away. The instructor looked south and within 20 seconds sighted WJZ at the same level. The instructor took control of the aircraft from the student, and conducted a 60° angle of bank turn to the left to avoid WJZ.

The instructor of WJZ sighted YCO when about 13 NM north-west of Gunnedah aerodrome at about 4,000 ft AMSL. YCO was then to their north in their 2 o'clock⁴ position. The instructor of WJZ conducted a left turn and reported sighting YCO commence a left. The aircraft passed at the same level about 150 to 200 m horizontally apart.

The instructors of the two aircraft subsequently communicated on the CTAF. The instructor of WJZ reported that they had not heard any relevant calls on the CTAF leading up to the incident.

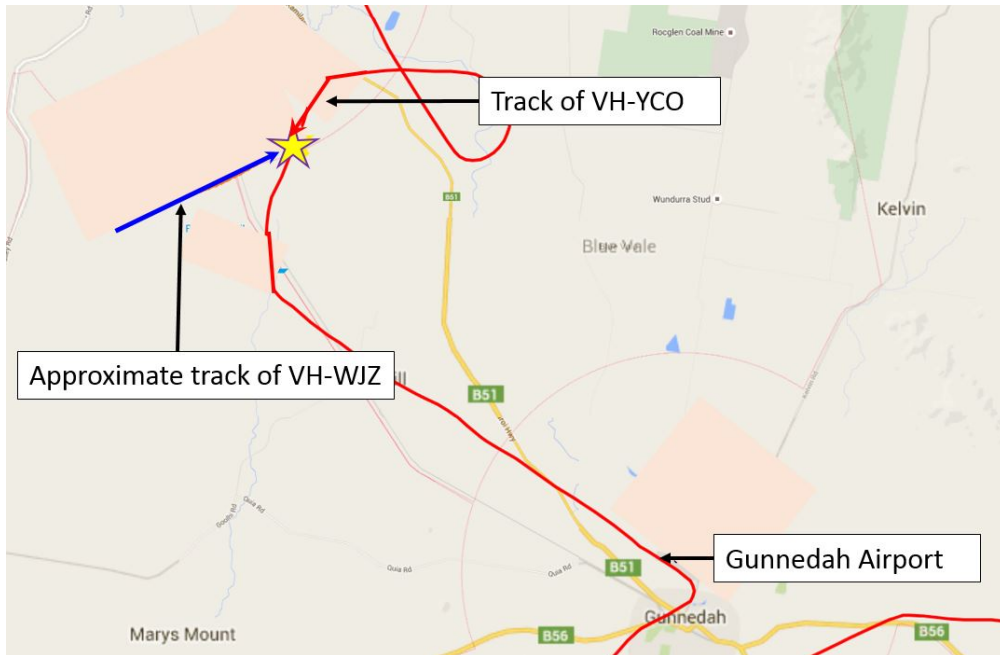
¹ Instrument flight rules permit an aircraft to operate in instrument meteorological conditions (IMC), which have much lower weather minimums than visual flight rules. Procedures and training are significantly more complex as a pilot must demonstrate competency in IMC conditions, while controlling the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

² An aerodrome frequency response unit (AFRU) assists in indicating selection of the correct VHF frequency at non-towered aerodromes by automatically responding with either a pre-recorded voice message if no transmission has been received in the last five minutes or otherwise a 'beep-back', on the CTAF.

³ Traffic collision avoidance device is an aircraft collision avoidance system. It monitors the airspace around an aircraft for other aircraft equipped with a corresponding active transponder and gives warning of possible collision risks.

⁴ 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.

Figure 1: Recorded track of VH-YCO, approximate track of VH-WJZ, and approximate location of near collision



Source: Instructor of VH-YCO – annotated by ATSB

Military radar control

The ADF established and operated a radar system in the vicinity of Tamworth to provide directed traffic information (DTI) to pilots operating CT4B aircraft in the Tamworth training areas. This was an interim measure to treat the risk of separation breakdown in the Tamworth training areas while those training areas and associated procedures underwent redesign and other systems were established. The DTI was provided on a discrete frequency monitored only by ADF aircraft. Directed traffic information was an advisory only service and controllers did not provide control or direction to pilots, but gave information aimed at increasing their situational awareness.

The military controller did not report any conflicting traffic before or during the incident.

Traffic collision avoidance device

YCO was fitted with a traffic collision avoidance device (TCAD), which warns of the presence of threat aircraft if the other aircraft is fitted with a functioning transponder that is being interrogated by a radar transmitter. The TCAD detects Secondary Surveillance Radar (SSR) transponders in aircraft within a certain proximity.

The TCAD displays threats detected within a predetermined volume of airspace known as a shield. The shield setting for the TCAD during the incident flight was +/- 1,000 ft in altitude and 2 NM. When a detected aircraft enters the pre-set shield, the pilot is alerted via aural and visual indications.

The TCAD system will not detect a threat aircraft that is not equipped with a transponder, the transponder is inoperative, or the transponder is operating but not being interrogated by either an SSR or a TCAS fitted aircraft. The TCAD is designed as an aid to situational awareness and should not be relied on for traffic separation.

In this incident, the TCAD identified WJZ as a threat and alerted the pilots of YCO.

Pilot comments

Instructor of VH-WJZ

The instructor of WJZ commented that the other aircraft was conducting military training and they have a radar in the Gunnedah training area, to provide them with traffic warnings. The military radar service did not identify any conflicting traffic, however, YCO's TCAD identified WJZ, which indicated that WJZ's transponder was functioning.

The instructor reported that there was some distortion in the broadcasts from YCO heard after the incident.⁵

The instructor further commented that in future, they would broadcast their position in the training area every 15 minutes; even if there were no broadcasts to indicate there may be nearby aircraft.

Instructor of VH-YCO

The instructor of YCO commented that if pilots of aircraft conducting instrument approaches broadcast their aircraft's position with reference to a compass, this may assist visual flight rules' pilots to assess whether there could be a conflict.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following safety action in response to this occurrence.

Operator of VH-WJZ

As a result of this occurrence, the operator of VH-WJZ has advised the ATSB that they are taking the following safety actions:

Airspace procedure

As the instrument approach lies within the Gunnedah training area, student pilots are required to remain below 3,000 ft when within 5° of the approach path. Additional risk assessments were conducted at the other company flying school locations and a similar hazard was found at Scone, where similar de-conflicting provisions have been made.

Safety message

The ATSB report [Limitations of the See-and-Avoid Principle](#) outlines the major factors that limit the effectiveness of un-alerted see-and-avoid. In this occurrence, un-alerted see-and-avoid did lead to the instructor of one aircraft sighting the other. However, insufficient communication between pilots operating in the same area is the most common cause of safety incidents outside controlled airspace and near non-controlled aerodromes. A broadcast that does not provide a clear understanding of the location of an aircraft, or the intentions of the pilot, is often ineffective in directing other pilots where to focus their lookout.

⁵ The instructor of YCO responded to this comment that they had not had any issues with their radios during the flight.

General details

Occurrence details

| | | |
|--------------------------|--|--------------------------|
| Date and time: | 15 April 2016 – 1450 EST | |
| Occurrence category: | Serious incident | |
| Primary occurrence type: | Near collision | |
| Location: | 24 km WNW of Gunnedah aerodrome, New South Wales | |
| | Latitude: 30° 49.07' S | Longitude: 150° 03.68' E |

Aircraft details: VH-YCO

| | | |
|-------------------------|------------------------|----------------|
| Manufacturer and model: | Pacific Aerospace CT4 | |
| Registration: | VH-YCO | |
| Serial number: | 087 | |
| Type of operation: | Flying training - dual | |
| Persons on board: | Crew – 2 | Passengers – 0 |
| Injuries: | Crew – 0 | Passengers – 0 |
| Aircraft damage: | Nil | |

Aircraft details: VH-WJZ

| | | |
|-------------------------|----------------------------------|----------------|
| Manufacturer and model: | Piper Aircraft Corporation PA-28 | |
| Registration: | VH-WJZ | |
| Serial number: | 28-8090006 | |
| Type of operation: | Flying training – dual | |
| Persons on board: | Crew – 2 | Passengers – 0 |
| Injuries: | Crew – 0 | Passengers – 0 |
| Aircraft damage: | Nil | |

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.