Australian Government
Australian Transport Safety Bureau

TCAS warning between a Cessna 310R, VH-AEY and a Fokker F28-100 VH-FKJ

near Karratha Airport, Western Australia, 22 May 2013

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Addendum

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TCAS warning between a Cessna 310R, VH-AEY and a Fokker F28-100, VH-FKJ

What happened

On 22 May 2013, at about 0710 Western Standard Time,[1] an Alliance Airlines Fokker F28-100 (F100) aircraft, registered VH-FKJ (FKJ), was approaching Karratha, Western Australia, on a scheduled passenger flight from Perth. FKJ tracked to approach Karratha on the 204 radial,[2] 11 NM behind a Boeing 717 (B717).

At 0714, a Cessna 310R (C310) aircraft, registered VH-AEY (AEY), departed Karratha on a charter flight to Exmouth, under the visual flight rules (VFR). During the climb, Karratha Tower air traffic control (ATC) instructed the pilot of AEY to track to intercept the 180 radial outbound, for segregation with the inbound F100.

At 0717, FKJ was approaching 21 NM from Karratha and 7,000 ft on descent, when the flight crew were cleared to make a visual approach and track to the airport. FKJ was 10 NM behind the B717 which was conducting an approach to a 5 NM final for runway 08.

At 0718, ATC provided the pilot of AEY with traffic information on an F100 aircraft on approach to Karratha, on the 204 radial at about 13 NM. The pilot replied that the traffic had been sighted in the 2 o'clock[3] position. The pilot was then instructed by the controller to pass behind that aircraft and track direct to Exmouth. The pilot believed at this stage that the B717 was the aircraft AEY was to pass behind and as AEY was well clear of that aircraft, the pilot commenced tracking to Exmouth. AEY was climbing and passing through about 2,500 ft.

At 0719, AEY appeared on the traffic collision avoidance system (TCAS)[4] display in FKJ as proximity traffic. At this time, FKJ had left 6,000 ft on descent and was tracking to a 5 NM final. As AEY came within 5 NM on the TCAS display, the crew levelled the aircraft off at about 4,000 ft, as a precaution.

The crew of FKJ then received a TCAS traffic advisory (TA).[5] Neither of the crew sighted AEY, which was climbing and approaching 4,000 ft.

At about the same time, the pilot of AEY made a visual scan and saw the F100 (FKJ) coming towards AEY in a 10 o'clock, high, position, about 1 to 2 NM away. The pilot pushed forward on the control column and the aircraft descended about 200 ft as FKJ passed overhead. At 0720, the crew of FKJ received a TCAS resolution advisory (RA)[6] climb instruction, which they complied with. The TCAS display showed that AEY passed about 700 ft below FKJ (Figure 1).

FKJ landed without further incident.

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1 Western Standard Time (WST) was Coordinated Universal Time (UTC) + 8 hours.

2 A radial is a magnetic bearing from a navigation aid or station.

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.

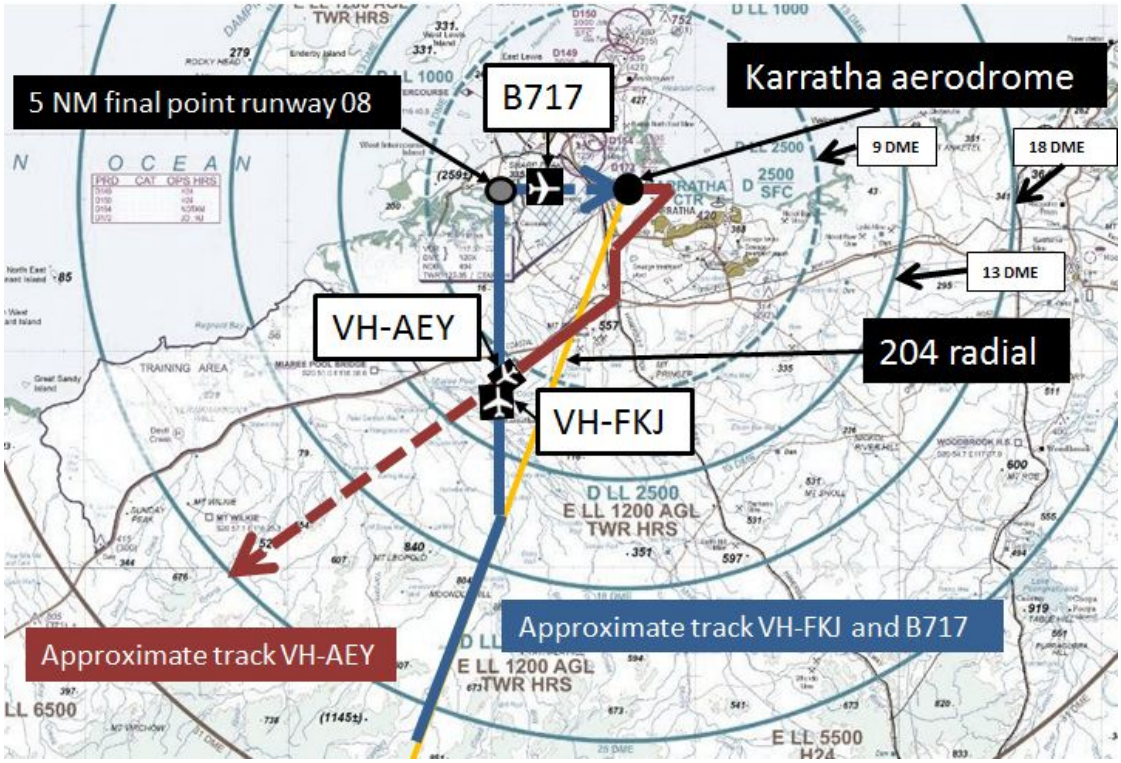
4 TCAS is an aircraft collision avoidance system. It monitors the airspace around an aircraft for other aircraft equipped with a corresponding active transponder and gives warning of possible collision risks.

5 When a TA is issued, pilots are instructed to initiate a visual search for the traffic causing the TA.

6 When an RA is issued pilots are expected to respond immediately to the RA unless doing so would jeopardize the safe operation of the flight.

At the time of the incident, there were two controllers in Karratha Tower; the second one was assisting by using binoculars to sight inbound aircraft. Karratha Tower had one radio with some over-transmissions at the time.

Figure 1: Approximate positions of the B717, VH-FKJ and VH-AEY at 0720



Source: Airservices Australia and pilot recollections

Pilot comments VH-AEY

The pilot reported that the B717 had been misidentified as the F100, resulting in believing that separation was being maintained. The pilot commented that if traffic information had been provided by ATC on the B717, the F100 may have been correctly identified.

Air traffic controller comments

The air traffic controllers provided the following comments:

- The traffic level at Karratha at the time of the incident was moderate and they were focused on separating the two instrument flight rules IFR aircraft.
- After instructing AEY to turn right to intercept the 180 radial, neither of the controllers saw AEY again to confirm its position.
- When the pilot of AEY advised that the traffic had been sighted in the 2 o'clock position, this fitted in with the controller's mental picture of where they expected FKJ to be, if AEY was established on the 180 radial.
- The controllers did not consider the B717 to be relevant traffic for AEY, as AEY was not in conflict with the B717. However, given the similar appearances of the F100 and B717, in hindsight, advising AEY that there was a second jet, the B717, on early right base may have enabled the pilot to distinguish between the two aircraft.
- ATC is only required to provide traffic information to VFR aircraft, but they try to offer additional service by keeping the IFR aircraft out of conflict with VFR aircraft.
- The controller stated that in future, rather than giving an instruction to pass behind the traffic, he would continue the aircraft outbound on the 180 radial and request the pilot to report at 10 NM before turning to intercept the track to Exmouth.

Safety action

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

Operator of VH-AEY

As a result of this occurrence, the operator of AEY advised the ATSB that they have asked their pilots conducting VFR flights from Karratha to request an ATC clearance to depart at 1,500 ft until 10 NM, before climbing and turning to intercept the planned track.

Operator of VH-FKJ

As a result of this occurrence, the operator of FKJ discussed with company pilots, the need to maintain see-and-avoid principles when approaching an airport. This will be reviewed regarding an upcoming company flight safety awareness publication.

Safety message

Traffic information should include relevant and sufficient information to enable pilots to identify the aircraft. The content of traffic information passed to an aircraft is based on a controller's judgement of what is relevant.

In this incident, the benefits of TCAS are highlighted as the jet aircraft involved had a TCAS and the other aircraft had an operational transponder. This demonstrates the importance of aircraft having operational transponders.

Pilots need to be aware of the limitations of the see-and-avoid principle, particularly when operating in Class D airspace. This incident highlights the importance of listening and communicating. The ATSB publication, *Limitations of the See-and-Avoid Principle* is available at: www.atsb.gov.au/publications/2009/see-and-avoid.aspx

Further information on Class D airspace, including the Class D airspace booklet and eLearning tutorials, is available from the Civil Aviation Safety Authority (CASA) at: www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD:611458872:pc=PC_93379

General details

Occurrence details

Date and time:	22 May 2013 – 0720 WST	
Occurrence category:	Incident	
Primary occurrence type:	TCAS	
Location:	Karratha, Western Australia	
	Latitude: 20° 42.73' S	Longitude: 116° 46.40' E

Cessna 310, VH-AEY

Manufacturer and model:	Cessna Aircraft Company 310R	
Registration:	VH-AEY	
Type of operation:	Charter – passenger	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Fokker F28-100, VH-FKJ

Manufacturer and model:	Fokker F28-100	
Registration:	VH-FKJ	
Operator	Alliance Airlines	
Type of operation:	Air transport – high capacity	
Persons on board:	Crew – 4	Passengers – 78
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.