



Australian Government

Australian Transport Safety Bureau

Aircraft proximity event – two Cessna 172S, VH-EWE and VH-EOP

Moorabbin Airport, Victoria – 19 July 2012

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Aircraft proximity event – two Cessna 172S, VH-EWE and VH-EOP

AO-2012-099

What happened

On 19 July 2012, at about 1622 Eastern Standard Time¹, the pilot of a Cessna 172S aircraft, registered VH-EOP (EOP), broadcast on the Moorabbin Airport, Victoria, Tower frequency advising he was inbound from the 'Academy' visual flight rules approach point, following a Cessna 182T aircraft, registered VH-NEG (NEG). The pilot of EOP was instructed by Moorabbin air traffic control (ATC) to join the downwind leg of the circuit for runway 35 Right (R)². At the same time, the flight instructor and student pilot of another Cessna 172S aircraft, registered VH-EWE (EWE), were on downwind, conducting circuit training.

Moorabbin is a general aviation airport, which operates under Class D³ control zone procedures. In Class D airspace, ATC provides visual flight rules (VFR) aircraft with traffic information on other VFR aircraft. However, it is ultimately the pilot's responsibility to sight and maintain separation.

At about 1625, EOP joined downwind following NEG. Soon after, the instructor and student of EWE conducted a touch-and-go⁴ and commenced another circuit.

When on downwind, the pilot of EOP noted that NEG was conducting a wider than normal circuit pattern to ensure separation with preceding aircraft. As a result, the pilot of EOP extended the downwind leg and commenced a wider base leg to maintain separation with NEG.

At about 1627, EWE was turned onto downwind, during which time the student made a broadcast on the Moorabbin Tower frequency advising they were turning downwind for a touch-and-go. Moorabbin ATC then instructed EWE to '...follow the Cessna turning, correction, on mid-base' (EOP). Both the instructor and student sighted a Cessna (NEG) in their 2 o'clock⁵ position on late base, and believed this to be the aircraft referred to by ATC (Figure 1). Given the distance between EWE and NEG, the instructor of EWE believed there was sufficient separation between the two aircraft. The pilot of EOP reported hearing EWE broadcast their downwind call.

At about 1628, the instructor and student of EWE visually looked for traffic within the vicinity, and with no aircraft sighted, a closer than normal base leg was commenced. When on base, they observed NEG about to land on runway 35R. At about the same time, EOP turned onto final.

A subsequent review of Airservices Australia surveillance data showed that, at about 1629, EOP and EWE were on converging tracks (Figure 2). Shortly after, the instructor and student of EWE again looked for traffic. With no traffic sighted, they commenced the turn onto final. The turn was conducted lower and later than normal. At about the same time, EOP received an ATC clearance to land.

The incident



Source: Pilot of VH-EOP

¹ Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.

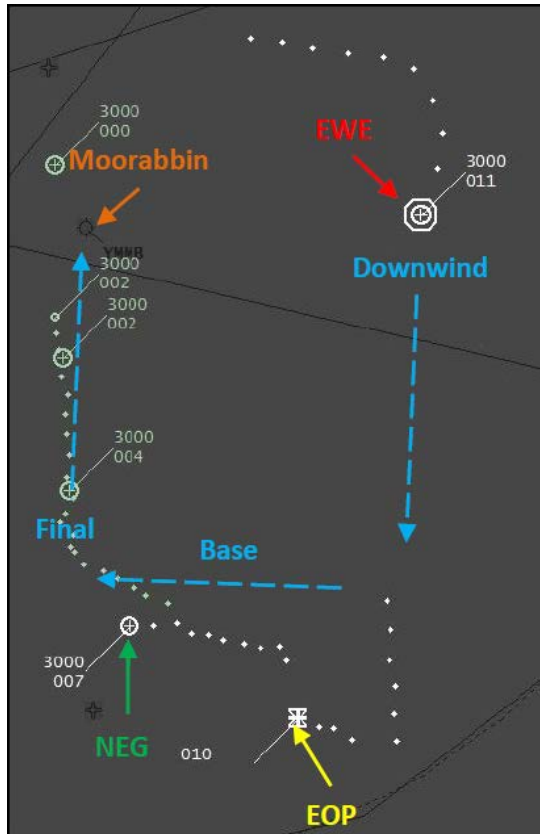
² Circuits on runway 35R were right hand in direction.

³ Class D: all aircraft must obtain an airways clearance and communicate with ATC. Instrument flight rules (IFR) aircraft are positively separated from other IFR aircraft and are provided with traffic information on all VFR aircraft. VFR aircraft are provided with traffic information on all other aircraft.

⁴ A touch-and-go is a practice landing whereby the aircraft is permitted to touch the runway briefly before taking off again.

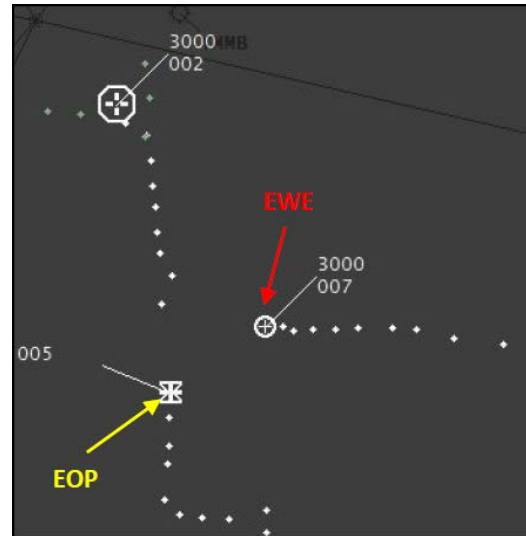
⁵ The clock code is used to denote the direction of an aircraft or surface feature relative to the current heading of the observer's aircraft, expressed in terms of position on an analogue clock face. Twelve o'clock is ahead while an aircraft observed abeam to the left would be said to be at 9 o'clock.

Figure 1: Aircraft positions at 1627



Source: Airservices Australia

Figure 2: Aircraft positions at 1629



Source: Airservices Australia

The pilot of EOP reported that several seconds later he observed EWE pass overhead from his right, about 10-20 metres in front of his aircraft (Figure 3). In response, he reduced engine power and raised the nose of the aircraft slightly to slow the aircraft and increase separation. The pilot then advised ATC that EWE had 'cut in front' of his aircraft. Air traffic control immediately instructed EWE to conduct a go-around. The student of EWE commenced a go-around and EOP landed without further incident.

The instructor of EWE reported that he was not aware of EOP operating in the circuit until after the incident occurred.

Figure 3: The incident



Source: Pilot of VH-EOP (from a dash mounted video camera)

Joining the circuit

The pilot of EOP stated that he did not make a broadcast when joining downwind as he was of the understanding that such a call was not required when inbound, unless instructed to do so by ATC. The Civil Aviation Safety Authority's (CASA) visual pilot guide (VPG) 2010 for the Melbourne basin, incorporating Moorabbin Airport, stated that 'unless otherwise instructed by ATC, you must report downwind when starting or joining the downwind leg'.

Instructor comments (VH-EWE)

The instructor of EWE reported that the following factors may have contributed to the incident:

- **Radio broadcasts:** The instructor stated that he could not recall hearing any broadcasts made relating to EOP. The student had recently commenced circuit training and the instructor had spent a reasonable amount of time throughout the lesson conversing and demonstrating. It was possible that any broadcasts made could have been missed. As a result of this incident, the instructor now limits his conversation. If a detailed explanation is required, he assumes control of the aircraft and demonstrates, rather than talking the student through the procedure.
- **Traffic scanning area:** The instructor reported that EOP may have been outside his normal scan area when looking for traffic due to the wide circuit pattern conducted by EOP.
- **Lookout vigilance:** The instructor was of the understanding that they were following NEG in the circuit. Consequently, when he observed NEG landing, he reported that his lookout vigilance may have reduced as he believed there was no other traffic to follow.
- **Wind:** The distance between EWE and EOP reduced as a result of a tailwind on downwind and a headwind on base and final.

When EWE received an ATC sequencing instruction⁶ to follow a Cessna on mid-base, both NEG and EOP were on the base leg. The instructor commented that the issue of a sequence number⁷ by ATC may have enhanced his situation awareness, particularly in the later stages of the circuit when NEG was observed landing.

Safety message

The practice of see-and-avoid has long been recognised as the primary method for minimising the risk of collision when flying in visual meteorological conditions; it is considered a crucial element of a pilot's situation awareness. An ATSB research report titled '*Limitations of the See-and-Avoid Principle*' showed that, when searching for traffic, alerted see-and-avoid (when a radio is used in combination with a visual lookout) is eight times more effective than unalerted see-and-avoid (when no radio is used). However, pilots should be mindful that the absence of a traffic broadcast does not necessarily mean the absence of traffic. Pilots should remain vigilant and employ both unalerted and alerted see-and-avoid principles to ensure the greatest level of traffic awareness is achieved.

Further information on the limitations of the see-and-avoid principle is available at:

- www.atsb.gov.au/publications/1991/limit_see_avoid.aspx

Aircraft details

Manufacturer and model:	VH-EWE: Cessna Aircraft Company 172S	
	VH-EOP: Cessna Aircraft Company 172S	
Type of operation:	VH-EWE: Flying training	
	VH-EOP: Private	
Location:	Moorabbin Airport, Victoria	
Occurrence type:	Aircraft separation	
Persons on board:	VH-EWE: Crew – 2	Passengers – Nil
	VH-EOP: Crew – 1	Passengers – 1
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.

⁶ Aeronautical Information Package (AIP) ENR 1.1-30 paragraph 15.1.2 states that 'In sequencing aircraft ATC will indicate the position of the preceding aircraft by reference to a leg of the circuit or as a clock bearing, and describe it either as a specific type or in general terms.' ATC may also issue a sequence number.

⁷ Sequence numbers specify the landing sequence position of an aircraft with respect to any preceding aircraft.

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.