Australian Government
Australian Transport Safety Bureau

Aircraft proximity event between two Cessna 172s, VH-EOE and VH-LWX

Moorabbin Airport, Victoria, 19 March 2013

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Aviation Occurrence Investigation
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Addendum

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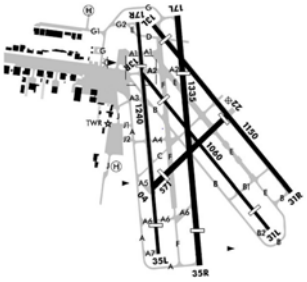
Aircraft proximity event between two Cessna 172s, VH-EOE and VH-LWX

What happened

Moorabbin Airport



Source: Airservices Australia

On the evening[1] of Tuesday19 March 2013, up to eight aircraft were operating under the visual flight rules (VFR)[2] in the circuit at Moorabbin Airport, Victoria in Class D[3] airspace. The numbers were typical for periods of night training at Moorabbin and fluctuated as some aircraft landed and others joined the circuit. At 2025 Eastern Daylight-saving Time,[4] there were six aircraft in the circuit, including two Cessna 172 aircraft, registered VH-EOE (EOE) and VH-LWX (LWX). Both aircraft were engaged in flying training, EOE with an instructor and student on-board and LWX with a solo student.

When LWX was on early downwind, the pilot advised Moorabbin air traffic control (ATC) of his intentions for the next approach and he was instructed to follow[5] the preceding aircraft mid-downwind (EOE).

As LWX approached the position where the pilot normally turned from downwind onto base, the pilot looked to the left and identified what he thought were the flashing lights of the aircraft he had been instructed to follow (Figure 1). The flashing lights were below the horizon against a background of lights from the surrounding Melbourne suburbs. The turn brought LWX onto a base leg inside that of EOE (Figures 2 and 3).

Approaching the position where he was to turn onto final approach (Figure 4), the pilot of LWX looked to the right, to check for aircraft on final further away from the airport, then looked left and again misidentified the aircraft he had been instructed to follow.

At about 2028, as the pilot of LWX levelled out on final (Figure 5), ATC queried whether he still had the aircraft he had been instructed to follow in sight. Before he could answer, the instructor pilot of EOE transmitted he was descending as '…they're passing right over the top of us'. After acknowledging EOE, ATC instructed the pilot of LWX to go-around[6] (Figure 6).

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1 On the night of 19 March 2013, last light was at 2000, 28 minutes prior to the incident. Last light is the time when the centre of the sun is at an angle of 6° below the horizon following sunset. At this time, large objects are not definable but may be seen and the brightest stars are visible under clear atmospheric conditions. Last light can also be referred to as the end of evening civil twilight.

2 Visual flight rules (VFR) 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.

3 Class D – All aircraft must get an airways clearance and communicate with air traffic control. IFR aircraft are positively separated from other IFR aircraft and are provided with traffic information on all VFR aircraft. VFR aircraft are provided traffic information on all other aircraft.

4 Eastern Daylight-saving Time was Universal Coordinated Time (UTC) + 11 hours.

5 The instruction to 'follow' requires the pilot to sight the preceding aircraft, and regulate the aircraft's circuit speed and approach path to achieve longitudinal separation.

6 Go around – overshoot straight ahead.

The following figures are a sequence of radar screen shots showing VH-LWX and VH-EOE with the misidentified aircraft (circled).

Figure 1

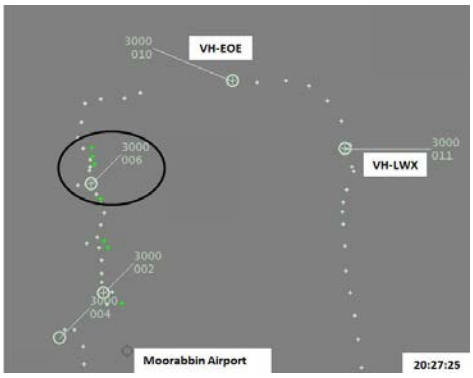


Figure 2

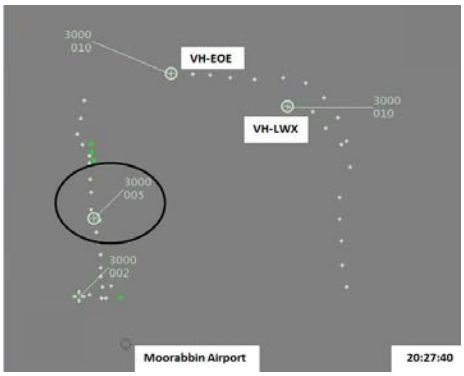


Figure 3

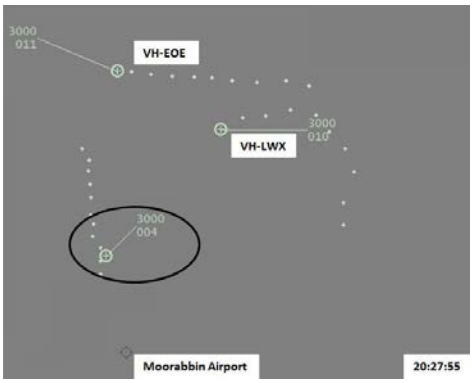


Figure 4

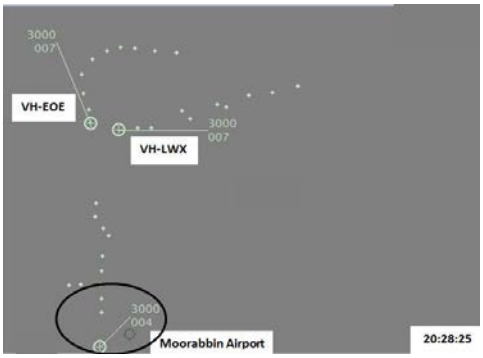


Figure 5

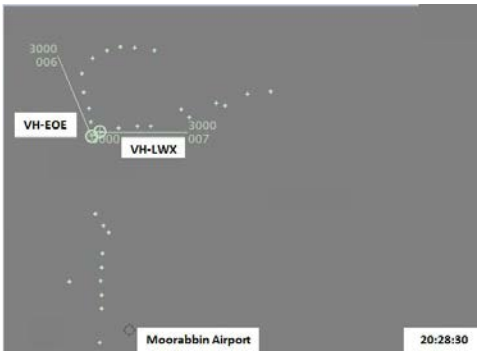
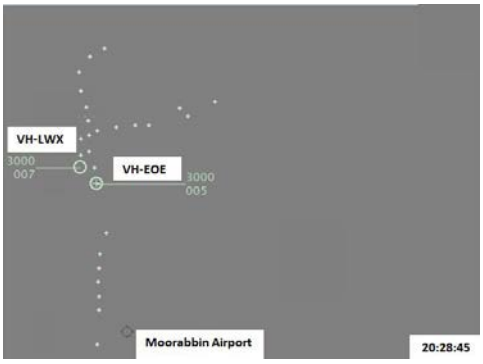


Figure 6



Source: Airservices Australia

Air traffic services at Moorabbin Airport

During daylight-saving time, Class D air traffic services (ATS) were provided at Moorabbin Airport until 2200 on Tuesdays and Wednesdays. On other weekdays, ATS was provided until 2100 and on weekends and public holidays, until 1900. Moorabbin ATC limited the number of aircraft in the circuit at night to eight[7] by requiring aircraft wishing to operate in the circuit to obtain a start clearance.

Flying training at Moorabbin

Up to 13 flying training organisations operate at Moorabbin. Although there may not be a requirement for night flying during all types of training, the majority include night flying as part of the syllabus.

[7] At the time of the incident, there were six aircraft operating in the circuit.

The CASA produced *Flight Instructor Manual (Aeroplane)* included a chapter on night flying and noted that a pre-flight briefing should include the number of aircraft engaged in night flying at a given time.

On the evenings when air traffic services were not available at Moorabbin, the Aviation Information Publication (AIP)[8] Australia stated that the airspace became Class G[9] and common traffic advisory frequency (CTAF)[10] procedures applied. The AIP further stated that, during CTAF operations, the number of aircraft in the circuit was limited to five and that circuits were not permitted after 2200 on weekdays and 2100 on weekends and public holidays.

Pilot comments (VH-EOE)

The instructing pilot of EOE commented that the aircraft's landing light may have been off for training purposes. Additionally, he commented that there was a lot of aircraft in the circuit with constant radio traffic at the time of the incident, and that the circuit pattern was wider than normally expected. The instructing pilot also commented that the preference was to send students solo for night circuits only on those nights when air traffic services were provided, resulting in a concentration of traffic on those nights.

Pilot comments (VH-LWX)

The pilot of LWX commented that he did not see EOE until after the other pilot had broadcast that he was descending. Stretching up in his seat, he then observed EOE appear from underneath the cowl of his aircraft. Additionally, he commented that the provision of a sequence number[11] may have aided his situational awareness. He added that an all stations broadcast by Moorabbin ATC of the number of aircraft in the circuit at a regular interval may also have assisted the pilot to maintain situational awareness.[12]

ATSB investigation 200203449

The Australian Transport Safety Bureau (ATSB) investigation into a midair collision at Moorabbin airport in 2002 involving two C172 aircraft found that one of the aircraft misidentified the aircraft it was following onto final at night. However, that collision occurred when air traffic services were not provided. The investigation report is available at www.atsb.gov.au/publications/investigation_reports/2002/aair/aair200203449.aspx

ATSB comment

The *Review of Midair Collisions Involving General Aviation Aircraft in Australia between 1961 and 2003*, published by the ATSB, found that most of the midair collisions in Australia had occurred in the circuit area, and a high proportion of those on the final approach or the base-to-final turn. Although the review noted that there was a wide variety of contributing factors in the collisions with no dominant factors, the circumstances of a majority of the collisions were consistent with the inherent difficulties in sighting aircraft in time to avoid a collision.

The review is available at www.atsb.gov.au/publications/2004/review_of_midair_collisions.aspx

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8 AIP – A package of documents that provides the operational information necessary for the safe and efficient conduct of national (civil) and international air navigation throughout Australia and its Territories.

9 Class G – IFR and VFR flights are permitted and do not require an airways clearance. IFR flights must communicate with air traffic control and receive traffic information on other IFR flights and a flight information service. VFR flights receive a flight information service if requested.

10 CTAF – Common traffic advisory frequency is the frequency on which pilots operating at a non-towered aerodrome should make positional radio broadcasts.

11 Airservices Australia clarified with the ATSB that sequence numbers were not required as per the AIP ENR 1.1 paragraph 15.1.3 and that sequence numbers were normally provided by ATC (particularly during rapidly changing landing sequence in a busy circuit) unless there was the possibility of confusion amongst aircraft.

12 Airservices Australia advised that they considered that such a procedure was not compatible with current ATC procedures and the impact on pilot situational awareness had not been validated.

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-LWX

As a result of this occurrence, the operator of LWX has advised the ATSB that they have implemented a night-flying checklist to record details briefed to students on expected flight conditions and traffic densities.

Operator of VH-EOE

As a result of this occurrence, the operator of EOE has advised the ATSB that they have implemented a procedure to liaise with other training organisations at Moorabbin to determine the number of aircraft programmed for night circuits.

Safety message

The following ATSB reports provide further information on aircraft proximity events at Moorabbin.

- AO-2012-099 – Aircraft proximity event – two Cessna 172s, VH-EWE and VH-EOP at Moorabbin airport on 19 July 2012, available at www.atsb.gov.au/publications/investigation_reports/2012/aair/ao-2012-099.aspx
- AO-2012-111 – Airspace related event between Cessna 172, VH-EPB and Piper Warrior, VH-BZE, Moorabbin Airport, Victoria on 27 August 2012, available at www.atsb.gov.au/publications/investigation_reports/2012/aair/ao-2012-111.aspx
- AO-2012-159 – Aircraft proximity event between two Piper PA-28 aircraft, VH-LXH and VH-TAU at Moorabbin Airport, Victoria, 26 November 2012, available at www.atsb.gov.au/publications/investigation_reports/2012/aair/ao-2012-159.aspx

The CASA *Flight Instructor Manual (Aeroplane)* is available at www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_90306

General details

Occurrence details

Date and time:	19 March 2013 – 2028 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Airprox	
Location:	Moorabbin Airport, Victoria	
	Latitude: 37° 58.55' S	Longitude: 145° 06.13' E

Cessna 172R, VH-LWX

Manufacturer and model:	Cessna Aircraft Company 172R	
Registration:	VH-LWX	
Type of operation:	Flying training – solo	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Cessna 172S, VH-EOE

Manufacturer and model:	Cessna Aircraft Company 172S	
Registration:	VH-EOE	
Type of operation:	Flying training – dual	
Persons on board:	Crew – 2	Passengers – Nil
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.