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Australian Transport Safety Bureau

VFR into IMC involving Cessna 172, VH-EOV

near Gold Coast Airport, Queensland, 19 March 2016

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Addendum

Page	Change	Date

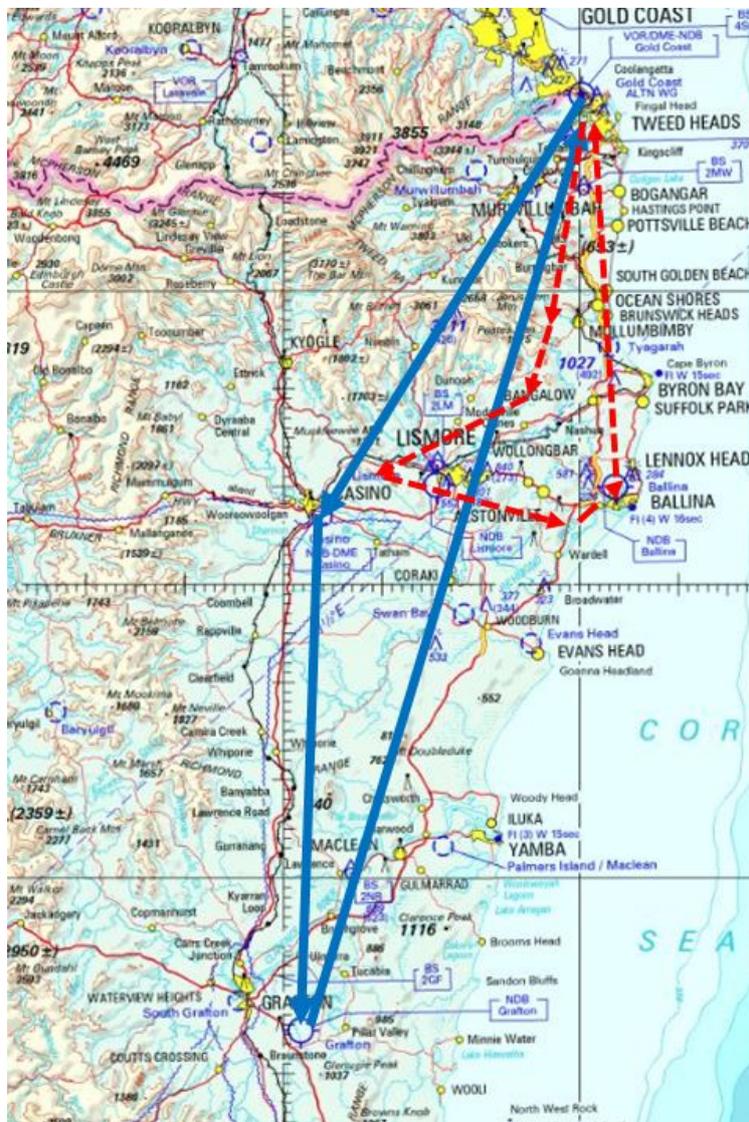
VFR into IMC involving Cessna 172, VH-EOV

What happened

On 19 March 2016, a student pilot prepared for their first solo navigation training exercise in Cessna 172, registered VH-EOV (EOV). The flight was planned from the Gold Coast Airport, Queensland (Qld), overhead Casino, and onto Grafton Airport, New South Wales (NSW). The return leg plan was from Grafton Airport direct to the Gold Coast Airport (Figure 1 blue lines).

Prior to departure, the pilot and their instructor checked the flight plan and discussed the weather forecast. They both then checked the live weathercam¹ at Lismore Airport, NSW, as Lismore is close to Casino. The weathercam showed some fog and low cloud, with clear skies above. As a final assessment, the pilot and instructor walked outside and visually assessed the conditions.

Figure 1: Flight planned track (blue), approximate track flow (red)



Source: Aairservices Australia Armdale World Aeronautical Chart annotated by ATSB

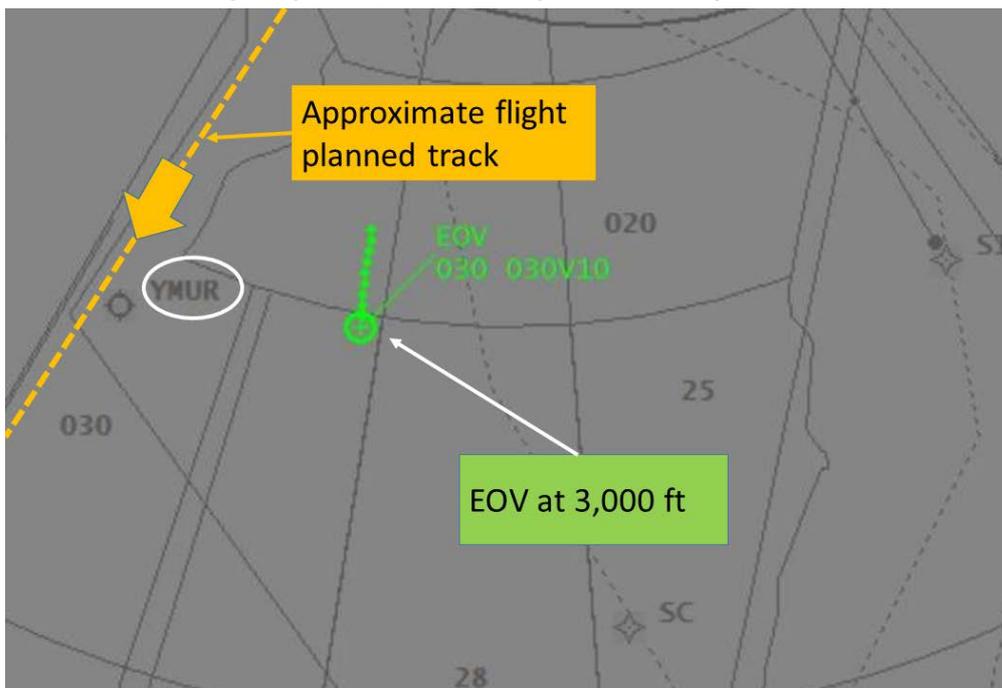
¹ Weathercam is a network of real time cameras located around Australia recording real time weather.

The instructor was satisfied that the low cloud at Lismore would soon burn off and the pilot would be able to complete the visual flight rules (VFR)² navigation exercise at the planned level of 6,500 ft above mean sea level. The instructor then prepared to depart on another flight. About thirty minutes later, the instructor taxied past EOV in another aircraft and noted that the pilot was still preparing EOV for the flight.

At about 1012 Eastern Standard Time (EST), EOV departed on runway 14, about 1.5 hours after they were approved by the instructor to depart. Due to jet traffic, the Gold Coast Tower controller instructed the pilot to make a right turn after take-off (on to their planned track) and climb to 2,500 ft. About two minutes later, the Tower controller cleared EOV to climb to 3,000 ft. As the pilot initiated the right turn, they assessed that the weather conditions on their intended track were worse than they had expected, with the visibility ahead reduced by haze and cloud.

Part way through the right turn, the pilot unintentionally stopped the turn and started to track in a southerly direction, instead of south-westerly toward Casino. Noting that the aircraft was not tracking as expected, the Tower controller asked the pilot to confirm their current heading. The pilot asked the controller to 'standby'. With no further response from the pilot, the controller then instructed them to turn right onto a heading of 250°. However, the pilot continued to track about 40° left of track (Figure 2). To assist the pilot, the controller advised them of their current position, cleared the aircraft from that position direct to Casino, and as per normal procedure, and instructed the pilot to change frequency to contact Brisbane Approach.

Figure 2: Flight planned track to Casino in yellow. EOV (green) tracking to the east of Murwillumbah Airport (YMUR, white circle) in a southerly direction



Source: Airservices Australia – annotated by ATSB

The aircraft was now very close to cloud and the pilot had turned all their attention to this threat. At 1020, the pilot contacted the Approach controller to request a climb to not above 5,500 ft, as this would give them flexibility to climb or descend as required to avoid entering cloud. The Approach controller advised the pilot there would be a short delay prior to this request being approved. During this period, EOV entered cloud.

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.

The pilot spent the next few minutes focussed solely on the flight instruments but did not inform the controller that they were in cloud. The Approach controller then approved the pilot to climb to 5,000 ft. While still in cloud, the pilot began the climb, and inadvertently started to turn left. The Approach controller questioned what heading the pilot was on and when the pilot could not answer correctly, they suggested a heading for Casino. The pilot turned on to the suggested heading. The pilot then observed a break in the cloud below them and requested a descent. The Approach controller approved the descent and asked the pilot to confirm that operations were normal. The pilot replied that all their instruments were working correctly. The pilot then descended to 1,500 ft and exited the cloud. The pilot later estimated that they were in cloud for approximately three minutes.

The pilot had a brief radio discussion with their instructor, who was flying in a different aircraft in the vicinity. Their instructor advised them that Casino Airport was closed. Making the decision to discontinue the navigation exercise and to return to the Gold Coast along the coast, the pilot turned EOV to the east. At 1100, the pilot advised Brisbane Centre (Centre) air traffic control (ATC) that they were about 3 NM east of Lismore, and were now tracking to the coast. At 1105, Centre ATC identified EOV on radar 4 NM south of Ballina, NSW.

The pilot of EOV did not change the radio frequency to the common traffic area frequency (CTAF) as required when transiting within 10 NM of Ballina. At 1108, as a regular public transport jet aircraft was inbound to Ballina, the Centre controller attempted to call the pilot of EOV to advise them of the conflicting traffic. However, the pilot did not respond. The Centre controller then issued a safety alert to the pilot of EOV advising the jet traffic was now at 1,100 ft (the same level as EOV). The pilot in EOV acknowledged this alert advising that they had the jet traffic sighted. The two aircraft passed within 1.7 NM of each other at a similar level.

As EOV tracked north along the coast toward the Gold Coast (red line in Figure 1), the Centre controller advised the pilot of a conflicting aircraft tracking southbound. The pilot acknowledged this call and advised they were looking for this traffic. The two aircraft passed without incident. The pilot then continued to the Gold Coast and landed without incident.

Pilot experience and comments

At the time of the incident, the pilot had logged about 46 flying hours. Three hours of this was instrument³ flight training.

The pilot provided the following comments:

- The weather had changed very quickly, and that it was different to that expected.
- They felt no pressure to conduct the flight. They had been briefed to ‘turn back’ to the Gold Coast if at any time they felt uncomfortable with the weather.
- They did not specifically alert ATC that they had entered cloud. They had however, advised ATC that they were uncertain of the aircraft’s position, and accepted assistance in that regard.
- They had attempted to program the “Direct To” function on the KLN89B GPS installed in the aircraft, but had not been able to get this to work. They were not confident in the use of the navigation aids (VOR and ADF).

The pilot reported that the level of stress they were under after entering cloud had added to the normal stress level of conducting a first solo navigation exercise. This had made processing information much more difficult, but they remained focussed on keeping the aircraft level using their limited experience relying solely on the flight instruments

The pilot had sat the Private Pilot Licence theory test the day prior to the flight, and therefore the week before the flight had been busy.

³ Without visual outside reference to simulate instrument meteorological conditions. Can be in a synthetic trainer or in an aircraft with an instructor with simulated IMC being attained by the trainee wearing a special ‘instrument hood’.

The pilot advised the best safety message to convey to other pilots with limited experience was to stay aware of the terrain around you. If the weather is not as expected, make an early decision to turn back.

Instructor experience and comments

The instructor held a Commercial Pilot's Licence with a grade 2 training endorsement.

This instructor had been the pilot's regular instructor and had conducted all the previous dual navigation exercises with them. The instructor reported that the student had previously experienced some difficulty with departures from the Gold Coast, but this had been addressed with training.

The instructor provided the following comments:

- They were surprised when the pilot had not departed until about 1.5 hours after being authorised to depart.
- They also found the weather worse than forecast and were surprised how much cloud was still around.
- By the time the pilot did depart, a safer cruising level would have been about 2,500 ft.
- All students at the flying school are exposed to basic use of the navigation aids at this stage of their training. Loading a flight plan into the GPS is demonstrated, but it is not expected that the student would be proficient in the use of these aids at this stage.
- While on another flight in the Casino area, they had advised the pilot by radio that Casino Airport was unserviceable.
- The student had done well in the instrument flight component of their training.
- They felt comfortable with the decision to let the pilot depart on the solo exercise that day.

Flying School comments

The flying school reported that the student departed with the intention of reaching the planned altitude of 6,500 ft with broken cloud at 3,500 ft without carefully considering alternative altitudes.

The school also advised that the student incorrectly used the VHF Omnidirectional Radio Range (VOR) for establishing the departure track and did not identify the cloud ahead in a timely manner.

The student did not clarify with ATC that a climb was required in order to remain in VMC and when they entered cloud, they did not follow the procedure to ensure they returned to VMC as quickly as possible.

Weather

Initial weather reports indicated that the conditions would be suitable for the solo flight. The Gold Coast Airport Aerodrome Forecast was for scattered cloud at 2,000 ft above ground level, with broken cloud at 3,500 ft. The Area Forecast pertinent to the planned flight indicated that the broken low cloud would lift by 0900.

ATSB comment

Pilots are encouraged to make conservative decisions when considering how forecast weather may affect their flight. If poor weather is encountered en route, timely and conservative decision making may be critical to a safe outcome. It is advisable to make a positive decision to turn back if the weather is not as planned and outside the capability of their experience level.

The ATSB also encourages pilots to seek assistance from ATC as soon as they find themselves in difficulty, or preferably, before the situation escalates to that point, so that ATC can provide timely assistance.

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 – flying school

As a result of this occurrence, flying school has advised the ATSB that they are taking the following safety actions:

A formalised brief will be given to all students prior to their first training area solo flight.

This brief will have an emphasis on:

- maintaining situational awareness when weather conditions are less than optimal
- the importance of maintaining VMC at all times will be re-addressed
- the importance of conducting a 180° turn on instruments if a pilot does inadvertently find themselves in cloud
- when encountering cloud, to include the phrase ‘due cloud’ in transmissions with ATC
- the importance of seeking early assistance from ATC, rather than letting the situation deteriorate
- when to use ‘request’ and when to use ‘require’ when seeking a clearance from ATC
- be clear on phraseology like ‘not above’ when requesting altitudes from ATC.

Safety message



The ATSB SafetyWatch highlights the broad safety concerns that come out of our investigation findings and from the occurrence data reported to us by industry.

[Flying with reduced visual cues](#) such as in this occurrence remains one of the ATSB’s major safety concerns.

[Number 4 in the Avoidable Accident series](#) published by the ATSB titled ‘Accidents involving pilots in Instrument Meteorological Conditions’ lists three key messages for pilots:

- Avoiding deteriorating weather or IMC requires thorough pre-flight planning, having alternate plans in case of an unexpected deterioration in the weather, and making timely decisions to turn back or divert.
- Pressing on into IMC conditions with no instrument rating carries a significant risk of severe spatial disorientation due to powerful and misleading orientation sensations in the absence of visual cues. Disorientation can affect any pilot, no matter what their level of experience.
- VFR pilots are encourage to use a ‘personal minimums’ checklist to help control and manage flight risks through identifying risk factors that include marginal weather conditions.

Available from CASA's online store are:

[Weather to Fly](#) – This DVD highlights the dangers of flying in cloud, and how to avoid inadvertent VFR into IMC.

[Flight Planning](#) – always thinking ahead. A flight-planning guide designed to help you in planning and conducting your flight. This guide includes a ‘personal minimums checklist.

SKYbrary have published an informative article looking at pre-flight risk management / and practical measures to maintain control for a limited period if a pilot had inadvertently flown [VFR into IMC](#).

General details

Occurrence details

Date and time:	19 March 2016 – 1210 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	VFR into IMC	
Location:	near Gold Coast Airport, Queensland	
	Latitude: 28° 09.87' S	Longitude: 153° 30.28' E

VH-EOV

Manufacturer and model:	Cessna Aircraft Company 172R	
Registration:	VH-EOV	
Serial number:	17280699	
Type of operation:	Flying training – Training solo	
Persons on board:	Crew – 1	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.