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Australian Transport Safety Bureau

VFR into IMC, involving a Piper PA28, VH-TAU

near Latrobe Valley Airport, Victoria, 8 September 2015

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Addendum

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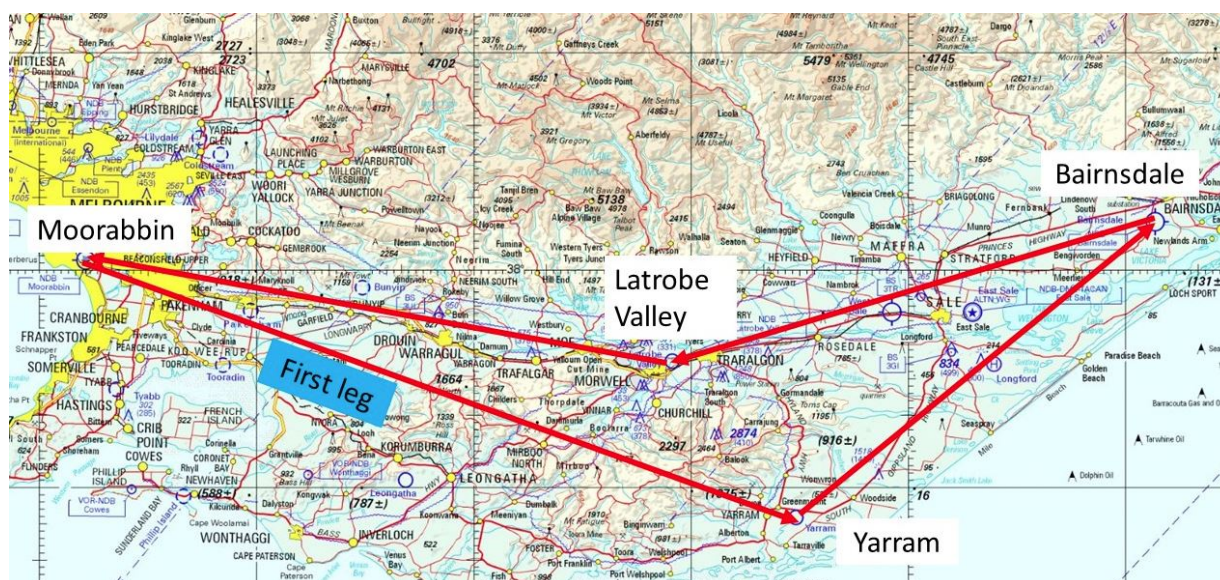
VFR into IMC involving a Piper PA28 aircraft, VH-TAU

What happened

Flight planning

On the morning of 8 September 2015, a pilot planned a navigation exercise from Moorabbin Airport, overhead Yarram aircraft landing area (ALA), and then on to Bairnsdale Airport, Victoria (Figure 1). The return flight from Bairnsdale to Moorabbin was to be via Latrobe Valley Airport, Victoria. The pilot had recently passed their Private Pilot Licence, and this solo navigational exercise was part of the training toward a Commercial Pilot Licence.

Figure 1: Planned route for the navigation exercise



Source: Aircservices Australia Melbourne World Aeronautical Chart (WAC)

The pilot reviewed the Area 30 weather forecast, including the terminal area forecasts (TAFs)¹ and METARs² for Moorabbin, Latrobe Valley, and Bairnsdale, to assess the suitability of the conditions for the planned visual flight rules (VFR) flight.

The Area 30 Forecast (ARFOR) overview, issued at 0805 Eastern Standard Time (EST), which covered the time of the flight, predicted isolated scattered showers, and snowfalls above 4,000 ft. Low cloud with precipitation particularly on the windward slopes was also forecast. It was expected that this low cloud would contract to the north-east section of Area 30 by 1200, and clear by 1400. The wind below 5,000 ft was forecast as south-westerly and between 20 and 25 kt. A note stated that winds up to 5,000 ft were forecast to be 10-20 kt stronger in the east (including the Bairnsdale region).

Confident that the flight could be safely conducted under the VFR, the pilot then discussed the planned route, and associated weather forecasts with a senior instructor at the flying school. During this discussion, the pilot and instructor decided that due to the METAR at Bairnsdale

¹ A Terminal Area Forecast (TAF) is a statement of meteorological conditions expected for a specified period in the airspace within a radius of 5NM of the aerodrome reference point.

² METAR: Routine aerodrome weather report issued at fixed times, hourly or half-hourly.

Airport indicating strong winds of up to 35 kt, the pilot should make an assessment upon arrival there. If the pilot did not assess the wind as suitable/safe for landing, the brief was to overfly the airport and commence the return leg to Latrobe Valley. They also decided to delay the flight's departure time from Moorabbin, so that the planned arrival time back into Latrobe Valley fell outside the INTER/TEMPO³ period for this airport.

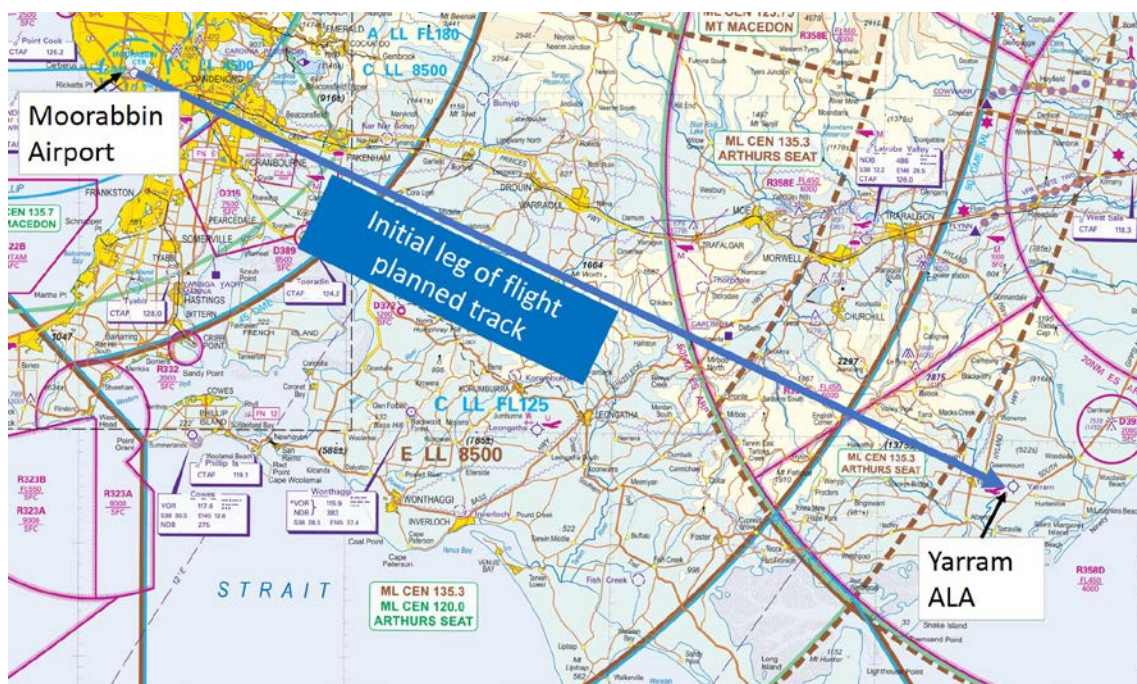
Pilot recollection of the flight

The pilot prepared a Piper PA28 (Warrior) aircraft, registered VH-TAU (TAU), and then departed Moorabbin at the delayed time of 1239. The pilot reported that both the departure and initial climb went as planned.

To maintain separation from the cloud, the pilot levelled the aircraft at about 3,000 ft above mean sea level (AMSL) and conducted a crosscheck of their calculations. They visually confirmed the aircraft's location, noting this on the flight plan.

About 15 NM into the initial leg of the flight (Figure 2), the pilot reported noticing some cloud on the ranges around the aircraft, with the base at about 3,000 ft. Still with the mindset that the weather was suitable for the flight, and wanting to continue, the pilot elected to fly around the lower patches of cloud. At this stage, they were confident that they could 'push on'. The pilot reported that they had accompanied a friend on the same navigation exercise the previous week, in similar weather conditions. The pilot's friend had had been successful in negotiating the weather and completing the flight.

Figure 2: Initial leg of flight planned track, from Moorabbin Airport to overhead Yarram ALA



Source: Aircservices Australia – Melbourne Visual Navigation Chart annotated by ATSB

In hindsight, the pilot reported an unawareness of how thick and widespread the cloud ahead really was, and how it was different to what had been expected. After manoeuvring around several patches of cloud, the pilot made a decision to conduct a 180° turn onto the reciprocal track, and

³ INTER An intermittent deterioration in the forecast weather conditions, during which a significant variation in prevailing conditions is expected to last for periods of less than 30 minutes duration.
 TEMPO A temporary deterioration in the forecast weather conditions, during which significant variation in prevailing conditions are expected to last for periods of between 30 and 60 minutes.

return to Moorabbin. After logging the diversion time on the flight plan, the pilot initiated a turn to the left. Almost instantly, the pilot realised that the aircraft was now completely engulfed in cloud, and had entered instrument meteorological conditions (IMC). The pilot was not instrument rated, nor was the aircraft approved for flight in IMC. The aircraft was equipped with a Very High Frequency Omnidirectional Range (VOR), but the pilot had not been trained to operate this navigational aid.

Although having completed the mandatory basic instrument flight requirements during earlier training, the pilot had not been in cloud before; and reported feeling totally overwhelmed by such an unfamiliar environment. While trying to control the aircraft solely by reference to the instruments, the pilot reported having an escalating concern about the aircraft's altitude, the height of the surrounding terrain, and the total loss of visual cues to be able to ascertain the aircraft's position.

The request for assistance

At about 1313, the pilot reported stopping the turn at a heading of about 300 °M, levelling the wings, and called Melbourne Centre for assistance (see Table 1).

Melbourne Centre clarified the aircraft's position, and placed an uncertainty phase (INCERFA⁴) on the aircraft. The air traffic controller (ATC) then contacted the instructor in an instrument flight rules (IFR) Cirrus S22, VH-QQT (QQT), who was conducting dual IFR training at nearby Latrobe Valley Airport. The controller at Melbourne Centre confirmed the in-flight conditions with the instructor in QQT, who advised that the cloud tops were about 6,500 ft. Both the instructor and controller then focussed on assisting the pilot in TAU.

Assistance provided by instructor in QQT

The experienced instructor in QQT began providing assistance over the radio to the pilot in TAU. After establishing the facts, and the pilot's level of experience, the instructor in QQT began to 'mentor' the pilot in TAU. The instructor was concerned about the current altitude, which was below the lowest safe altitude (LSALT) of 3,400 ft in the area, and the possibility of icing. Therefore, the instructor talked the pilot through maintaining a focus on keeping the aircraft wings level (to prevent a turn), while initiating a climb through the thick layer of cloud.

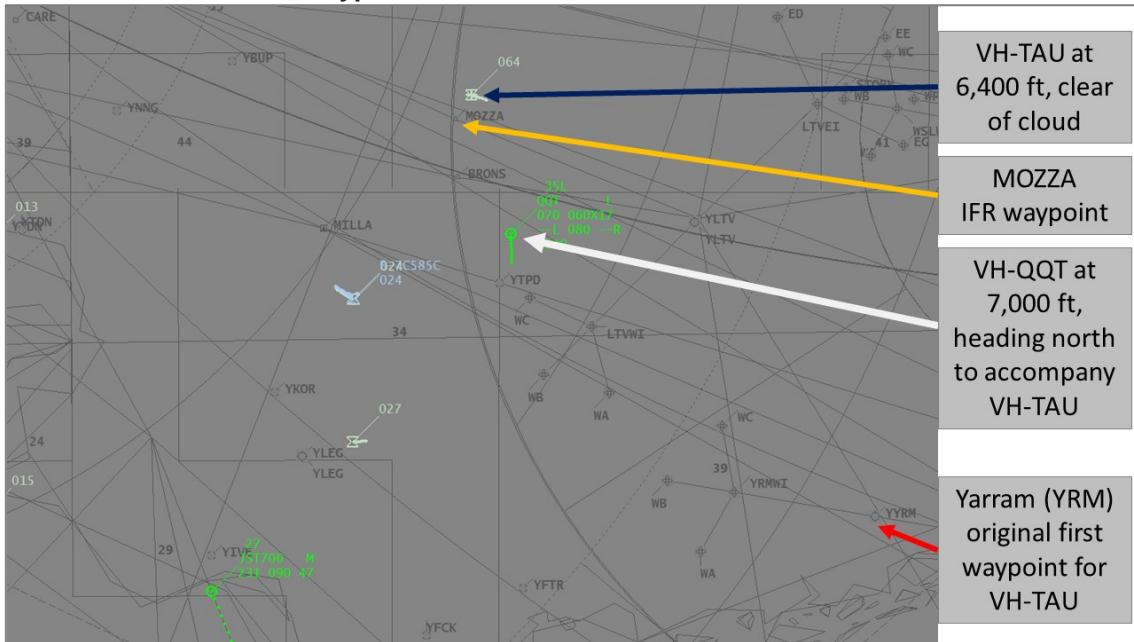
The instructor in QQT was able to work methodically with the pilot in TAU, focusing on reducing the pilot's workload and keeping them calm. The instructor requested all the required airspace clearances for both aircraft from ATC; and ATC assisted in arranging and expediting these. The pilot in TAU reported clear of cloud at about 6,400 ft, some 15 NM north of the original flight planned track (Figures 3 and 4).

ATC then provided vectors to the instructor in QQT to locate TAU, which was now some distance from the Cirrus. The instructor advised that the transponder paint of TAU on the traffic collision avoidance system (TCAS) in QQT had kept 'dropping out'.

The instructor in QQT continued to work closely with ATC who again arranged all required clearances for both aircraft in tandem, back to Moorabbin. As part of this assistance, ATC advised the instructor that there was a large break in the cloud over Port Phillip Bay west of Moorabbin. The two aircraft travelled to this area and once the instructor had confirmed that the pilot in TAU was orientated, and able to manage the descent, approach and landing back into Moorabbin, the two aircraft parted and TAU landed uneventfully some minutes later.

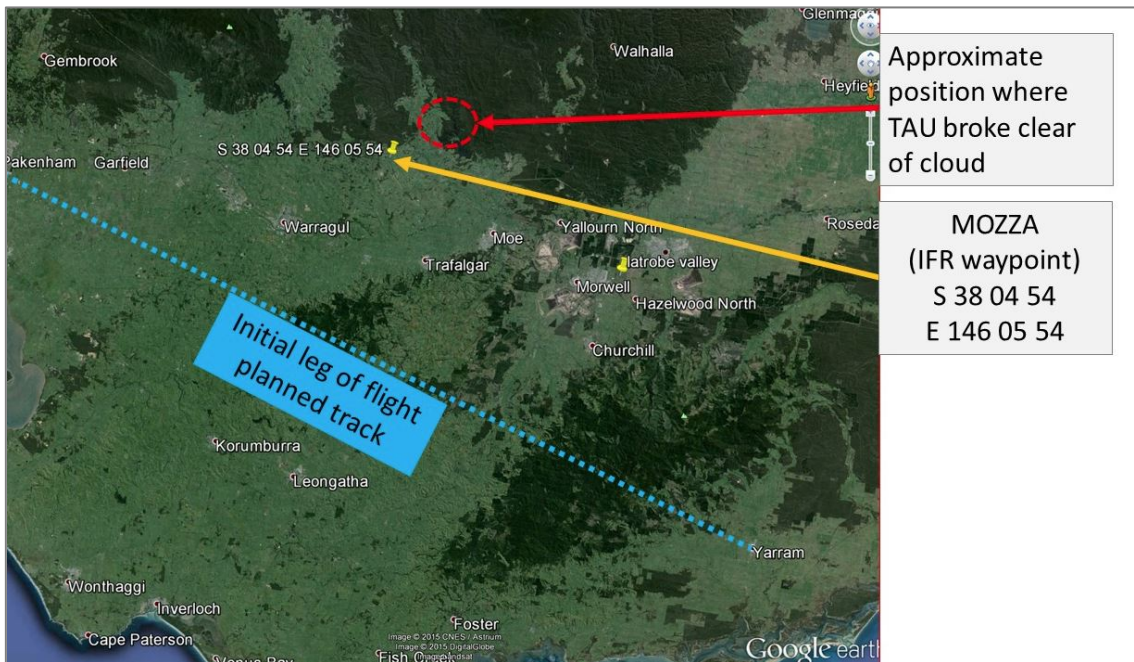
⁴ INCERFA is the first of three alert phases available to ATC. This is a phase of 'uncertainty' in regard to the welfare of the aircraft and its occupant(s).

Figure 3: Surveillance image at about the time VH-TAU first broke clear of cloud. Note distance from intended waypoint of Yarram



Source: Airservices Australia annotated by the ATSB

Figure 4: Google earth representation of where TAU broke clear of cloud



Source: Google earth annotated by ATSB

Actual flight path

The ATSB was provided with surveillance data from Airservices Australia. Table 1 presents a summary of what the surveillance data showed.

Table 1: Surveillance data – main points

Local time	Heading	Altitude	Comment
1239	TAU departed Moorabbin Airport		
1300	TAU on track for Yarram	Gradually descended from 3,100 ft to 2,400 ft	
1303-1307	Commenced a left turn, took up an easterly heading	Moved between 2,400 ft and 2,800 ft	
1309	Left turn continued through north and around to the south-west	2,900 ft	This placed TAU almost directly under QQT. QQT is at 5,800 ft in a right hand holding pattern at Latrobe Valley Whiskey Charlie (WC) for the RWY 03 RNAV
	TAU continued the left turn around to the south-east. Turn then continued back to the north-west	About 3,000 ft	
1313	TAU now heading west-south-west	3,100 ft	TAU has now completed in excess of 360°; QQT remained in a right-hand hold at WC, now at 3,900 ft. QQT on climb,
1313	PILOT IN TAU CALLS ATC FOR ASSISTANCE		ATC apply an INCERFA PHASE on TAU
1318-1321	TAU (being mentored) now on climb; changed heading to the right, through west, through north, to north-east	About 5,000 ft	TAU has now passed over IFR waypoint BRONS (south of MOZZA Figure 2); QQT remained in the hold at WC, and has climbed back to 6,600 ft, continued to 7,000 ft.
1322-1328	TAU turned to the north	Between 6,200 and 6,400 ft	TAU on top of cloud. Advises QQT and ATC

Source: Compiled by ATSB from Airservices Australia surveillance data

Relevant Terminal Area Forecasts (TAFs)

In addition to the overview of the Area 30 forecast mentioned previously, the relevant TAFs covering the period of the flight are as follows:

Moorabbin: Issued at 0907: Scattered cloud at 3,000-4,000 ft, with deteriorating conditions from 1800.

Bairnsdale: Issued at 1027: Wind from 250°T at 14 kt; 10 km visibility; light rain showers and scattered cloud at 3,000 ft, with broken cloud at 4,000 ft.

Latrobe Valley: Issued at 1030: 10 km visibility, light rain showers. Cloud few at 2,500 ft and scattered at 3,500 ft.

Safety message

The importance of seeking assistance from ATC as soon as a pilot is in difficulty, or preferably before they reach that point, cannot be overstated. This is a common and important message in most of the educational material on VFR into IMC scenarios. It almost certainly led to a good outcome in this occurrence. ATC could prioritise resources and gain assistance from a nearby aircraft. In this occurrence, good teamwork between the pilots of both aircraft and air traffic control ensured a successful outcome.

The ATSB and CASA publications listed below highlight the importance of really understanding the weather you may encounter at the planning stage, making good decisions, knowing your aircraft and all its equipment, and using a personal minimums checklist.

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.



<https://www.atsb.gov.au/safetywatch/flying-with-reduced-visual-cues.aspx>

Number 4 in the *Avoidable Accidents* series published by the ATSB, [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 encouraged 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 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'.

General details

Occurrence details

Date and time:	8 September 2015 at 1310 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	VFR into IMC	
Location:	Approximately 18 NM NNW of Latrobe Valley airport, Victoria	
	Latitude: 37° 54.43 S	Longitude: 146° 29.17 E

Aircraft details

Manufacturer and model:	Piper Aircraft Corporation PA28-161	
Registration:	VH-TAU	
Serial number:	2842209	
Type of operation:	Flying Training - solo	
Persons on board:	Crew – 1	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 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 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.