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Radio failure involving a Mitsubishi MU-2B, N64MD

What happened

On 5 April 2013, at about 0830 local time,[1] a Mitsubishi MU-2B aircraft (Figure 1), with United States registration, N64MD, departed Honiara, Solomon Islands with two pilots onboard. The purpose of the flight was to ferry the aircraft from Honiara to Essendon, Victoria, with an intermediate stop at Townsville, Queensland.

The pilot in command (PIC) reported that the aircraft's high frequency (HF) radio was unserviceable and their position reports were relayed to air traffic control (ATC) via other aircraft operating in the area. However, when about 150 NM from Townsville, the crew were able to communicate directly with ATC using the very high frequency (VHF) radio.[2]

The aircraft landed at Townsville and was refuelled. The PIC also submitted a flight plan to Airservices Australia providing details on the aircraft's planned route and cruise altitude.

Figure 1: A Mitsubishi MU-2B aircraft

Source: Hans Grubb

At about 1354 Eastern Standard Time,[3] the flight departed under the instrument flight rules (IFR). The aircraft had full fuel on board, which included 341 L in each wing tip tank and 379 L in a ferry fuel tank installed behind the pilots' seat.

Shortly after takeoff, as the landing gear was retracted, both pilots heard a considerable amount of static in their headsets.

Townsville Tower ATC then instructed the crew to transfer to the Townsville Approach frequency. The PIC read back the instruction; however, ATC advised that he was transmitting carrier wave[4] only (no voice communications were heard). Air traffic control informed the pilot that, if he could

[1] Honiara local time was Coordinated Universal Time (UTC) + 11 hours.
[2] The aircraft was equipped with two VHF radios (COMM 1 and COMM 2).
[3] Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours.
[4] The transmitted radio wave, without voice, is heard.

hear ATC, to set the aircraft transponder to 'squawk ident'[5] and to try a different radio or frequency.

About 5 minutes after the aircraft departed, Townsville ATC offered the crew the option of returning to Townsville. The PIC reported that they could hear the transmissions made by Townsville ATC, but were unable to return to Townsville as the fuel quantity in each wing tip tank was in excess of the maximum landing limitation[6] and the aircraft was carrying additional fuel in the ferry tank. The PIC was unable to advise Townsville ATC of this as the aircraft's VHF radios were now inoperable. Consequently, the PIC elected to continue the flight as per the submitted flight plan.

The PIC attempted to resolve the radio problem by turning the radios off and on, changing frequencies, transferring between COMM 1 and COMM 2, recycling the radio circuit breakers, changing headsets, and using the handheld microphone, but without success. He also considered changing the transponder to the radio failure code of '7600',[7] however, elected to continue with the code previously assigned as the aircraft had already been identified on radar by Townsville ATC.

Townsville ATC continued attempts to re-establish communications with the crew and declared an uncertainty phase (INCERFA).[8] About 7 minutes after departing, Townsville ATC again offered the crew the option to return to Townsville.

As the aircraft approached the Townsville/Brisbane airspace boundary, Townsville ATC advised the crew that they would not be allowed to enter Brisbane airspace without a serviceable radio and instructed them to conduct right hand orbits and return to Townsville.

At about 1408, with the pilot having elected to continue the flight as per the flight plan, the aircraft entered Brisbane airspace and was transferred from Townsville ATC to Brisbane Centre ATC. Brisbane ATC attempted to establish communications with the aircraft and suggested that the crew try the HF radio. The aircraft was observed on Airservices Australia radar climbing to the planned level of flight level (FL)[9] 210.

During the cruise, the PIC also attempted to use his mobile telephone; however, there was no signal.

At about 1503, when 250 NM south of Townsville, the aircraft left radar coverage.

Brisbane ATC continued attempts to re-establish communications and left voice and text messages on both pilot's mobile telephones and utilised two overflying aircraft. The Australian Search and Rescue (AusSAR) were also briefed on the uncertainty phase.

At about 1625, the aircraft was transferred from Brisbane Centre ATC to Melbourne Centre ATC. Melbourne Centre continued attempts to contact the aircraft.

When about 230 NM north of Essendon, the PIC established communications with the crew of an overflying aircraft, who contacted Melbourne Centre on his behalf. Melbourne Centre provided the PIC with a different frequency and at 1731, communications with ATC were re-established. The uncertainty phase was cancelled and the flight continued to Essendon and landed without further incident.

The crew were not in normal communications with ATC for about 3 hours and 35 minutes.

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5 A phrase used by ATC to ask a pilot to activate the identification feature on the aircraft's transponder. Once the feature is activated, ATC can immediately establish the aircraft's identity.

6 The aircraft flight manual stated that, for landing, the maximum fuel quantity in each tip tank was 227 L.

7 Selecting the code '7600' on the transponder indicates to ATC that the aircraft's radios have failed.

8 Aeronautical Information Publication (AIP) GEN 3.6 Section 5 paragraph 5.1.1: an uncertainty phase may be declared when an aircraft is known or believed to be subject to irregular operations; namely, when it is experiencing navigational, altitude or communications difficulties.

9 At altitudes above 10,000 ft in Australia, an aircraft's height above mean sea level is referred to as a flight level (FL). FL 210 equates to 21,000 ft.

The PIC reported that, throughout the duration of the flight, he continued to broadcast on the Brisbane Centre and Melbourne Centre frequencies.

Radio examination

A subsequent examination of the radio determined that water leakage from a small access door had corroded two main radio isolator breakers/switches, which subsequently resulted in the radio failure. The aircraft had been left outside for some time and subjected to tropical storms.

Communications failure

The En Route Supplement Australia (ERSA) stated that, in the event of a radio failure in controlled airspace, pilots should:

- squawk 7600
- listen out on the automatic terminal information service (ATIS) and/or voice modulated navigation aids
- transmit their intentions and make normal position reports (assume the radio transmitter is operating and prefix calls with ‘transmitting blind’).

The ERSA also provides guidance for aircraft operating in visual and instrument meteorological conditions. It further notes that that these procedures ensure that ATC and other traffic should be aware of the pilot’s most likely actions and pilots should follow these procedures unless strong reasons dictate otherwise.

In the event of an emergency, and when other conventional means of communication are either inadequate or not available, the ERSA suggests that mobile telephones may be used to contact ATC and AusSAR. Telephone numbers for the individual ATC locations and the SAR hotline are listed in ERSA GEN FIS Section 16 ‘Use of mobile telephones in aircraft’.[10]

Safety message

According to Eurocontrol, a loss of communication generally results from one of three main reasons: radio interference; radio frequency change; or communication equipment problems. Whether brief, or prolonged, this has obvious flight safety implications, which may result in a failure to receive a new ATC clearance, leading to a loss of separation; inability to provide important information to ATC: and increased controller and pilot workload due the need to resolve any confusion.[11]

It is important that ATC is made aware of any problems as soon as possible. This provides ATC with sufficient time to manage a situation, rather than having to react when an issue has developed into a major problem. In the event of a communications failure, it is important that pilots follow the appropriate procedure, and if communications cannot be re-established, consider utilising alternative methods such as mobile telephones.

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[10] www.airservicesaustralia.com/aip/current/ersa/GUID_ersa-fac-2-9_30-May-2013.pdf

[11] www.skybrary.aero/bookshelf/books/111.pdf

General details

Manufacturer and model:	Mitsubishi MU-2B-60	
Registration:	N64MD	
Type of operation:	Private - ferry	
Occurrence category:	Incident	
Primary occurrence type:	Avionics/flight instruments	
Location:	Townsville Airport, Queensland	
	Latitude: 19° 15.15' S	Longitude: 146° 45.92' E
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Airspace related event between Bombardier DHC-8-402, VH-QOB and Robinson R22, VH-HLY

What happened

On 18 April 2013, a Robinson R22 helicopter registered VH-HLY (HLY), was being ferried from Cloncurry, Queensland to a property 200 km to the north.

The pilot conducted the pre-flight checks including checking that the radio was switched on and adjusted the squelch[1]. At about 1640 Eastern Standard Time,[2] the pilot broadcast his intentions and commenced taxiing from outside the hangar on a direct heading of 355°, in the direction of the property (Figure 1). About 2 minutes later, while taxiing towards the runway intersection, he looked ahead and to the left along the main runway, expecting that any arriving aircraft would be landing on runway 12 at Cloncurry.

At the same time, a Bombardier DHC-8 aircraft, registered VH-QOB (QOB) and operated by Sunstate Airlines, was conducting a scheduled service from Townsville, Queensland to Cloncurry. The pilot in command (PIC) of QOB made inbound broadcasts at 30, 10 and 3 NM on the common traffic advisory frequency (CTAF). The crew did not hear any acknowledgment from other aircraft or the taxi broadcast from HLY. The crew had elected to conduct a straight-in approach to land on runway 30.

As the helicopter crossed the runway at a height of about 100 feet, the pilot realised that he had not heard a response from the aerodrome frequency response unit (AFRU) on the CTAF (see explanation below). Simultaneously, he heard a call from QOB, which was in the landing flare for runway 30, stating that he should get off the runway.

The pilot of HLY then looked to his right and observed QOB on the runway. He realised he had been broadcasting on the incorrect ultra-high frequency (UHF) although he could hear calls on the very high frequency (VHF) CTAF.

The pilot of HLY estimated that, when QOB had touched down, the distance between the aircraft and HLY was about 1,000 m horizontally. The PIC of QOB estimated that the horizontal separation reduced to about 200 m.

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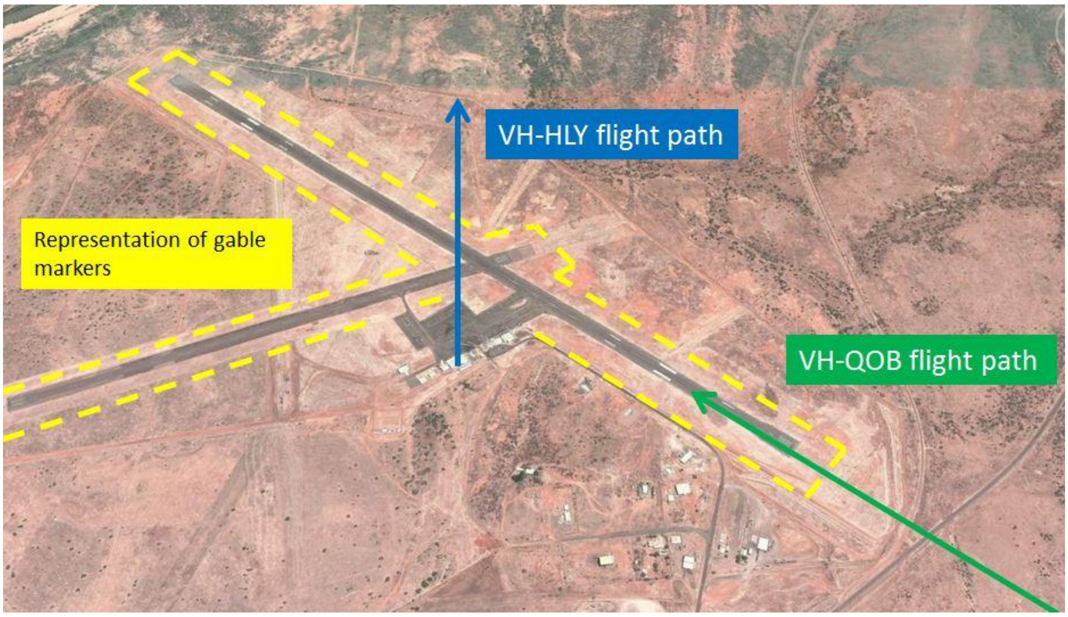
1 Pilot control of volume or signal/noise ratio.

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

Figure 1: Cloncurry aerodrome showing relative positions of VH-HLY and VH-QOB



Source: Google Earth

Pilot of VH-HLY comments

The pilot of HLY reported that he had been operating at Cloncurry in Robinson helicopters for 10 years. He stated that it was the first time he had not checked the radio switch during his pre-flight checks to make sure it was selected to transmit on VHF.

Due to the prevailing wind conditions, and the location of the aircraft loading bay at Cloncurry, he reported that most aircraft movements used runway 12 and he had not expected the arrival of an aircraft on runway 30. The pilot reported that the wind was from the south and he took off with a slight tailwind component to expedite his track to the north.

The pilot stated that the number of scheduled flights to Cloncurry had increased significantly over the last few years and that greater vigilance was required by the pilots who had been used to operating in the area without the higher traffic volume.

Pilot of VH-QOB comments

The PIC of QOB observed HLY in QOB's missed approach path. As the PIC did not want to conduct low-level manoeuvring, he considered that continuing with the landing was the safest action.

The PIC of QOB reported that they usually operate on runway 12, but as the aerodrome weather information service (AWIS) reported the wind from 210^{o}, he elected to conduct a straight-in approach to runway 30.

AFRU operation and radio transmissions

An AFRU assists in indicating selection of the correct VHF frequency at non-towered aerodromes by automatically responding with either a pre-recorded voice message if no transmission has been received in the last five minutes or otherwise a 'beep-back', on the CTAF. The pilot of HLY had made a radio broadcast, but as he was inadvertently transmitting on UHF, received no AFRU response.

The pilot of HLY did not hear any of the inbound broadcasts from QOB. VHF transmissions are line-of-sight transmissions. The location of the hangars at Cloncurry may have shielded the transmissions of the aircraft approaching runway 30.

The pilot of HLY reported that only a minute or two had elapsed after engine start prior to his departure, and he probably commenced listening on the CTAF after the 3 NM broadcast from QOB. The helicopter had crossed the runway within the time QOB took to approach and land from there.

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.

Helicopter operator

As a result of this occurrence, the helicopter operator has advised the ATSB that they are taking the following safety action:

Pre-takeoff hover

Helicopter pilots will hover at the gable markers prior to entering the runway and conduct a full visual inspection for aircraft.

Safety message

While experience and familiarity with operations are invaluable, they can also lead to complacency. It is therefore important that pilots with experience, familiarity and comfort with the aircraft and location, continue to do all checks thoroughly. The ATSB publication, *Avoidable Accidents No. 6 - Experience won't always save you,* is available at www.atsb.gov.au/publications/2012/avoidable-6-ar-2012-035.aspx.

Most occurrences reported to the ATSB at non-towered aerodromes involve conflicts between aircraft, or between aircraft and ground vehicles. In particular, active runways should be approached with caution. The ATSB has released *A pilot's guide to staying safe in the vicinity of non-towered aerodromes*, AR-2008-044 (1), available at www.atsb.gov.au/publications/2008/ar-2008-044(1).aspx.

General details

Occurrence details

Occurrence category:	Incident	
Primary occurrence type:	Airspace related event	
Location:	Cloncurry, Queensland	
	Latitude: 20° 40.12' S	Longitude: 140° 30.27' E

Robinson R22, VH-HLY

Manufacturer and model:	Robinson R22	
Registration:	VH-HLY	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Bombardier DHC-8-402, VH-QOB

Manufacturer and model:	Bombardier DHC-8-402	
Registration:	VH-QOB	
Operator:	Sunstate Airlines (Qld)	
Type of operation:	Air transport – high capacity	
Persons on board:	Crew – 4	Passengers – 36
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Piston aircraft

ATC procedural error involving a Piper PA-34, VH-FEJ

What happened

VH-FEJ

Source: Kyle Mayne

On 14 March 2012, the pilot of a Piper PA-34 aircraft, registered VH-FEJ (FEJ), submitted a flight plan from Archerfield to Cairns, with a planned refuelling stop at Townsville, Queensland. Prior to departure, air traffic control (ATC) at Archerfield updated the flight plan from visual flight rules (VFR) to instrument flight rules (IFR) at the pilot's request. The pilot was the sole person on board.

The updated flight plan for FEJ was transmitted via a change message in the Aeronautical Fixed Telecommunication Network (AFTN)[1] to the various ATC agencies responsible for the flight, including Townsville.

Townsville ATC, operated by the Department of Defence, utilised computer printed flight progress strips (strips). The strip for FEJ was printed prior to the change message being processed, and indicated that the flight involving FEJ was a VFR flight.

In the Townsville Approach area, the Planner position was responsible for checking the strips for aircraft arriving and departing Townsville. Once checked and activated, the strips were then passed to the Approach controller. At 1559 Eastern Standard Time,[2] the strip for FEJ was activated when Brisbane ATC provided an estimated time of arrival (ETA) at Townsville of 1628. As well as providing the ETA, Brisbane ATC also advised that FEJ was cleared at 10,000 ft, an IFR cruising level.

When the pilot of FEJ contacted Townsville Approach, he requested a runway 01 instrument landing system (ILS)[3] approach. The Approach controller cleared the aircraft to track direct to the initial approach fix and, once the aircraft was within 36 NM, cleared the pilot of FEJ to descend to 4,000 ft, the initial level for the ILS (Figure 1).

Shortly after, the Approach controller became concerned about FEJ maintaining visual meteorological conditions (VMC)[4] given the weather in the area, and queried the pilot on the aircraft's flight category. The pilot advised he was an IFR flight and was in cloud. The Approach controller immediately instructed the pilot to stop the descent at 5,500 ft. At the time, FEJ was passing through 5,300 ft, and descended to 5,200 ft before the pilot was able to arrest the descent and climb FEJ back to 5,500 ft. Shortly after and prior to commencing the ILS, the pilot became visual and FEJ landed without further incident.

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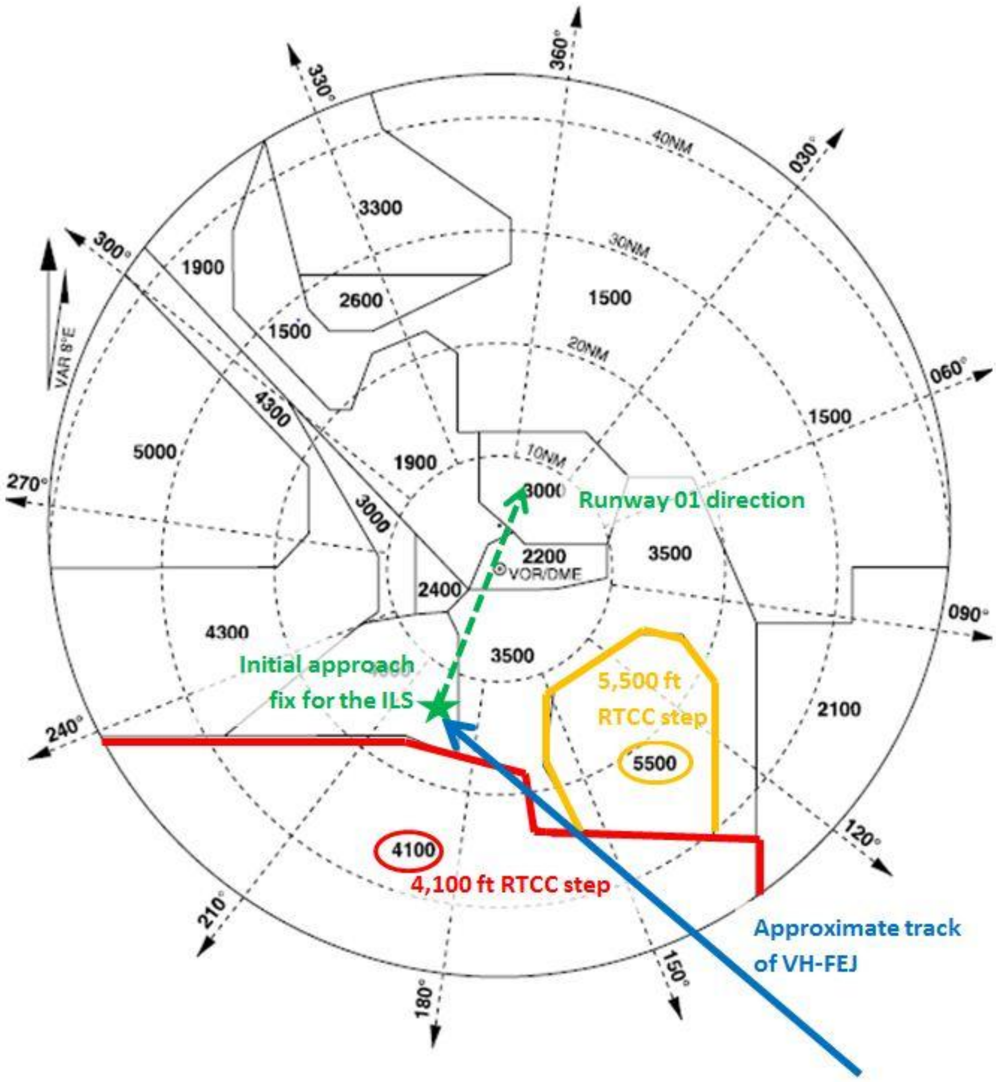
1 Aeronautical Fixed Telecommunication Network (AFTN) – an international aeronautical communication system for the exchange of messages.

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

3 Instrument landing system (ILS) is a ground aid to facilitate landing in low visibility conditions.

4 Visual Meteorological Conditions (VMC) is an aviation flight category in which visual flight rules (VFR) flight is permitted – that is, conditions in which pilots have sufficient visibility to fly the aircraft maintaining visual separation from terrain and other aircraft.

Figure 1: Townsville radar terrain clearance chart showing the approximate track of VH-FEJ



Source: Aeronautical Information Service

Meteorological information

The automatic terminal information service (ATIS) current during FEJ's arrival stated that pilots should expect an instrument approach. The wind was 090° magnetic at 16 knots, the visibility was greater than 10 km, with rain showers in the area and scattered cloud at 1,500 ft.

Department of Defence comments

The Department of Defence conducted an internal investigation into the incident and found that the Approach controller did not compare the flight rules category on the strip for FEJ with that displayed on the radar display, as the controller reported they expected the strip to be accurate. In addition, neither the Planner nor the Approach controller queried why FEJ was arriving via an IFR level. However, the report noted that it was not unusual for VFR aircraft to request an ILS at Townsville.

The radar terrain clearance chart (RTCC) displayed the lowest safe altitude ATC could descend an aircraft to in instrument meteorological conditions (IMC).[5] When the Approach controller determined that FEJ was an IFR flight, the aircraft had already been issued descent to 4,000 ft, which was 100 ft below the 4,100 ft RTCC step. As the track of the aircraft was in close proximity to the 5,500 ft step on the RTCC, the Approach controller sought to stop FEJ's descent at that level. By the time the pilot was able to arrest the aircraft's descent, FEJ had reached 5,200 ft. Although FEJ did not descend below the RTCC altitude on the aircraft's track, terrain clearance on track was not assured until FEJ climbed back to 5,500 ft (Figure 1).

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.

Department of Defence

As a result of this occurrence, the Department of Defence has advised the ATSB that controllers are now required to check flight progress strips thoroughly prior to passing them to Approach, ensuring the flight rules category is correct.

General details

Manufacturer and model:	Piper Aircraft Corporation PA-34-200T	
Registration:	VH-FEJ	
Type of operation:	Private	
Occurrence category:	Serious incident	
Primary occurrence type:	ATC procedural error	
Location:	37 km SW of Townsville Airport, Queensland	
	Latitude: 19° 27.30' S	Longitude: 146° 30.08' E
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

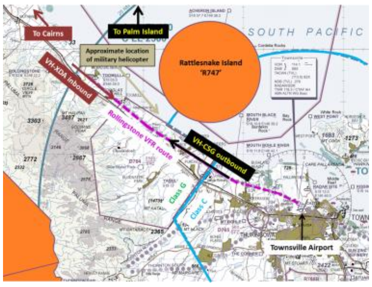
5 Instrument meteorological conditions (IMC) describe weather conditions that require pilots to fly primarily by reference to instruments, and therefore under Instrument Flight Rules (IFR), rather than by outside visual references. Typically, this means flying in cloud or with limited visibility.

Aircraft proximity event between a Kawasaki BK117, VH-CSG and a Cessna 404, VH-XDA

What happened

On 13 June 2012, at about 1458 Eastern Standard Time,[1] a Kawasaki BK117 helicopter, registered VH-CSG (CSG), departed Townsville on a flight to Cairns, Queensland, under the visual flight rules (VFR). The pilot requested a clearance from Townsville (military) air traffic control (ATC) to track outbound via the Rollingstone VFR route (Figure 1) at 1,000 ft. The pilot received a subsequent clearance to operate in Class C[2] airspace, not above 1,000 ft.

Rollingstone VFR route



Source: Airservices Australia

At about the same time, a West Wing Aviation Cessna 404 aircraft, registered VH-XDA (XDA), was inbound to Townsville from Palm Island, under the instrument flight rules (IFR). The aircraft was cleared by ATC to enter the Townsville military controlled airspace via the Rollingstone VFR route, at 1,500 ft, visual. This provided the required 500 ft vertical separation with CSG.

The initial section of the Rollingstone VFR route from Townsville was inside Townsville controlled airspace (Class C), while the latter part was outside controlled airspace (Class G)[3] when operating below 2,500 ft (Figure 1).

At 1502, the Townsville Approach controller (trainee) advised the pilot of CSG that he was now outside Class C airspace; provided traffic information[4] on a military helicopter operating in the vicinity, about 10 NM ahead, on descent to 2,500 ft (operating in Class C); and that the Brisbane Centre frequency was available when 36 NM from Townsville. The pilot acknowledged the call.

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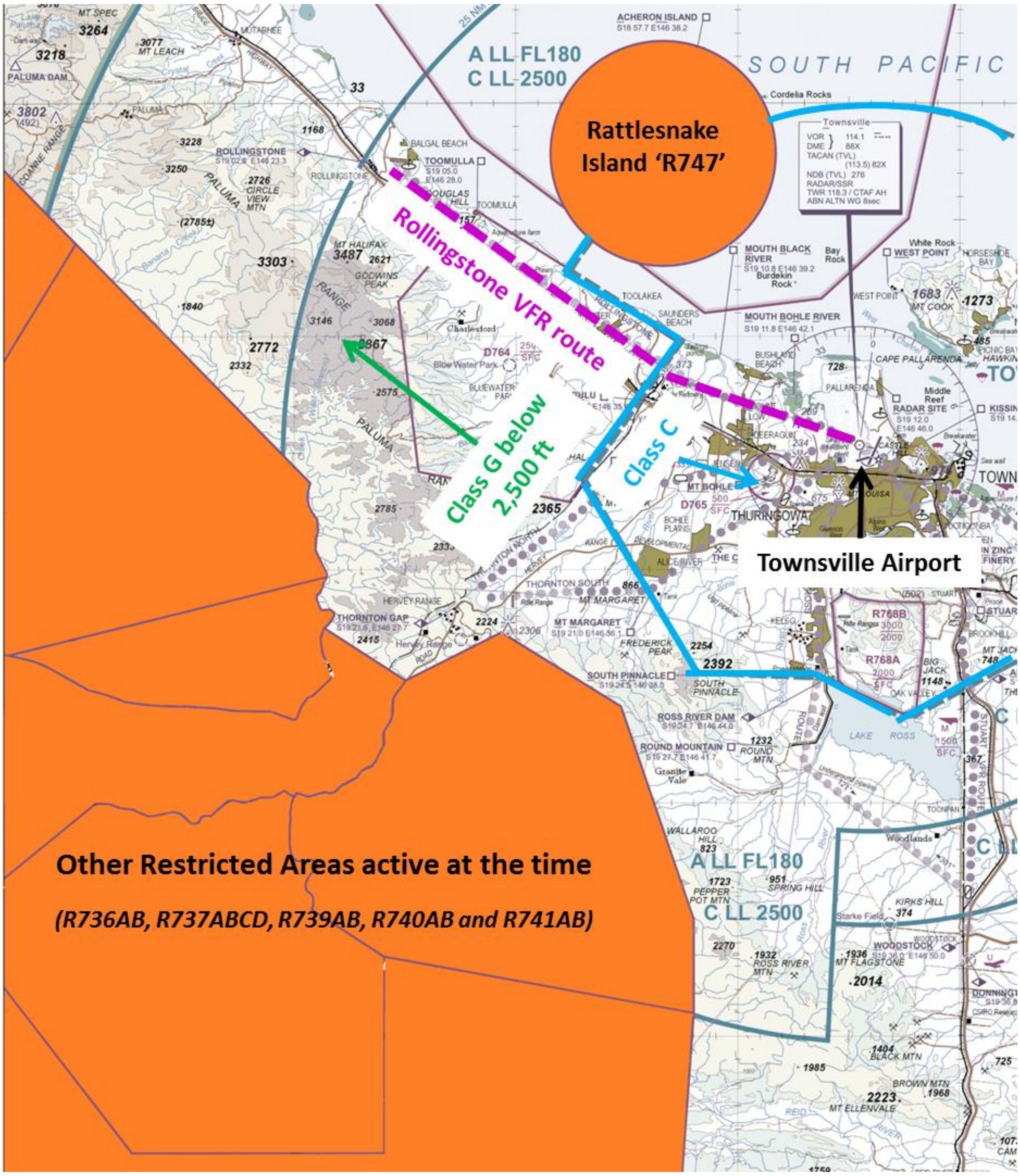
1 Eastern Standard Time (CST) was Coordinated Universal Time (UTC) + 10 hours.

2 All aircraft must get an airways clearance and communicate with ATC in Class C airspace. Instrument flight rules (IFR) aircraft are positively separated from both IFR and VFR aircraft. VFR aircraft are provided traffic information on other VFR aircraft.

3 IFR and VFR flights are permitted and do not require an airways clearance in Class G airspace. 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.

4 Information used by ATC to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid collision (Manual of Air Traffic Services).

Figure 1: Townsville airspace



Source: Airservices Australia

At this time, CSG and XDA were tracking along the Rollingstone VFR route in opposite directions, with about 15 NM lateral separation (Figure 2). The Approach trainee reported that, as CSG and XDA were more than 8 NM apart, the trainee intended to provide traffic information at a later stage, when the aircraft were close enough to be sighted by each pilot.

Soon after, the Approach trainee determined that the military helicopter may be a potential conflict for CSG and instructed the pilot of CSG to remain on the Townsville Approach frequency to ensure traffic updates could be provided, if required.

At 1504:05, the Approach trainee provided the pilot of the military helicopter with information on XDA. Shortly after, the pilot of XDA was also advised of the military helicopter, which was about 1 NM ahead in his 11 o'clock[5] position, operating above the Rollingstone VFR route at 2,500 ft. The pilot of XDA advised ATC that he had the military helicopter sighted. He continued to monitor that helicopter.

At 1504:30, the Department of Defence radar surveillance data[6] showed that CSG was at 1,000 ft and XDA was at 1,500 ft, with 7 NM lateral separation.

The pilot of CSG reported that he was aware of an aircraft operating in the area at 2,500 ft. Consequently, when CSG was in Class G airspace, the pilot elected to commence a slow climb to 1,500 ft, to maintain separation with the known traffic.

At 1504:40, the radar data showed that CSG was climbing through 1,300 ft and XDA was at 1,400 ft, with 2.8 NM lateral separation.

At 1506:20, the radar indicated that CSG was at 1,400 ft and XDA was at 1,500 ft, with 0.1 NM lateral separation. At that time, the pilot of CSG observed an aircraft ahead (XDA) and immediately descended. The pilot of CSG reported that he was at 1,260-1,280 ft when he passed an estimated 20-30 ft below XDA.

The pilot of XDA was in the process of broadcasting an inbound call on the company frequency when he observed a 'flash' (CSG) an estimated 6 ft below. The pilot immediately initiated a climb.

At 1506:30, after passing, the radar data showed both CSG and XDA were at 1,500 ft. Immediately after, the data showed CSG descending.

The pilot of XDA contacted the Townsville Approach trainee requesting information on the helicopter and advised that it nearly 'clipped' his aircraft. The Approach trainee advised the pilot that the helicopter was operating on the Rollingstone VFR route, not above 1,000 ft.

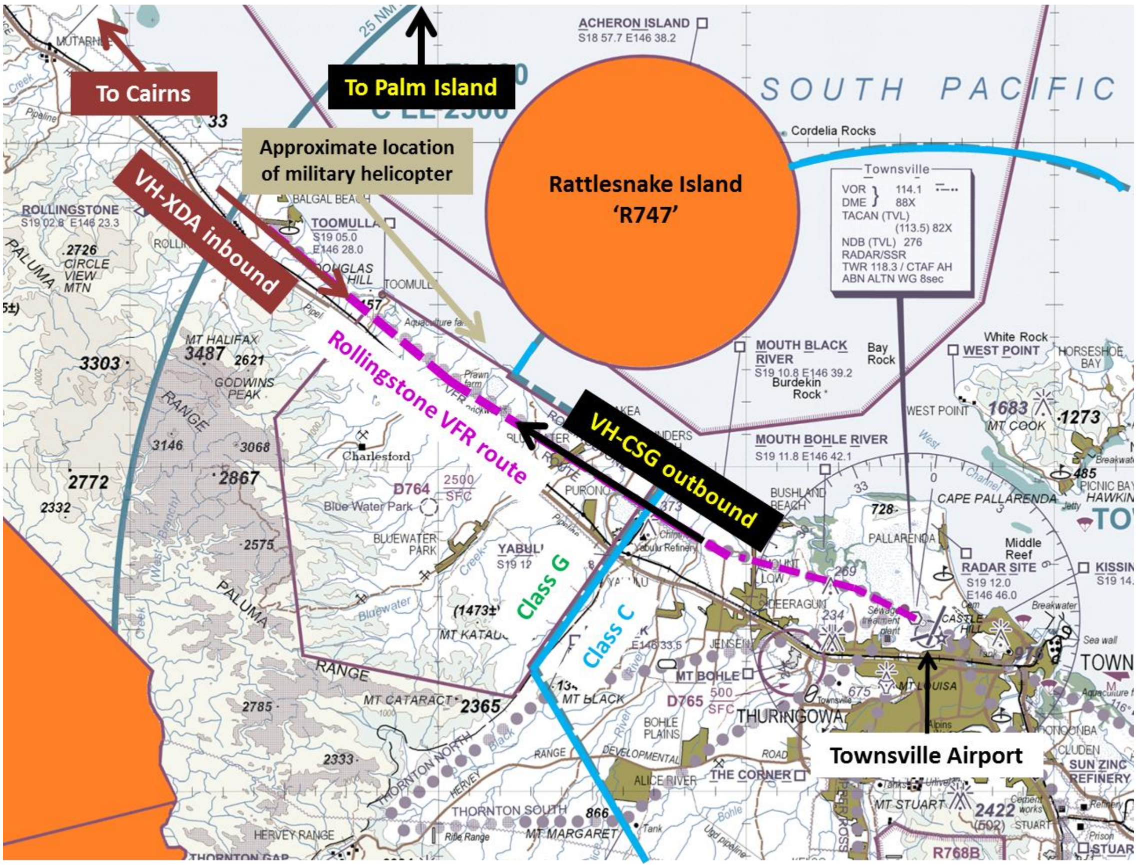
Both pilots reported that they were not aware of each other prior to the incident.

The Approach trainee, Approach Supervisor and Training Commander reported that the incident occurred during a complex sequence: there were multiple arrivals and departures; faster following jet aircraft; aircraft being vectored; and multiple active Restricted Areas. At the time, the traffic levels were considered above normal and they were primarily focusing on aircraft in Class C airspace and had placed a lower priority on XDA and CSG operating in Class G airspace. Consequently, traffic information was not provided to XDA and CSG.

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.

6 Altitude data was only displayed to the nearest 100 ft.

Figure 2: Positions along the Rollingstone VFR route



Source: Airservices Australia

Air traffic control

Approach trainee information

The Approach trainee had a total of 6 years ATC experience, with the majority of this obtained in both the Approach and Tower environments at Pearce, Western Australia. The controller had been at Townsville for 5 months and had completed about 75 hours of on-the-job training. At the time of the incident, the trainee was undergoing a proficiency assessment for the Townsville Approach endorsement. The trainee was being assessed by the Training Commander.

Supervision and monitoring

Townsville Approach ATC comprised a Planner position, the Approach trainee, and an Approach Supervisor. The Approach Supervisor provided advice on aircraft sequencing and assisted where required. The Approach Training Commander was also present in the room.

The Approach trainee reported that input from both the Approach Supervisor and Training Commander was being provided at the time of the incident.

Due to a broad area of responsibility, it was difficult for the Approach Supervisor to continually monitor every action of the Approach trainee. As a result of these responsibilities, the Supervisor's attention was not only divided between the Approach trainee and the Planner, but also diverted away from the current traffic situation. The Supervisor did, however, request that the Approach trainee keep CSG on the Townsville Approach frequency to maintain situation awareness and to provide traffic information, if required.

Townsville airspace

The Townsville Approach position was responsible for controlling airspace out to 36 NM, up to flight level (FL)[7] 220. On the day, there were a number of Restricted Areas active,[8] including the Rattlesnake Island 'R747' area (Figure 1). When R747 was active, aircraft departing/arriving Townsville to/from the north, north-west were directed via the western VFR diversion, the Rollingstone VFR route. Consequently, CSG was cleared to leave and XDA was cleared to enter Townsville Class C airspace via the Rollingstone VFR route.

The Approach Training Commander reported that the activation of R747 was a rare occurrence and there were minimal options available to controllers for diverting aircraft around that area. This was the first time the Approach trainee had seen R747 active and had military jet aircraft operating in R740 and R741 (Figure 1).

Flight information service (FIS) and traffic information in Class G

The Aeronautical Information Publication (AIP) En Route 1.4, paragraph 3.1.3, stated that, when operating in Class G, IFR flights receive traffic information and a flight information service (FIS).[9] Visual flight rules flights receive a FIS and may receive a surveillance information service (SIS)[10] if requested, dependent on ATC workload. CSG was not in receipt of a SIS at the time.

The AIP General 3.3, paragraph 2.13.1 further stated that:

> A traffic information service will be provided, where applicable, depending on higher priority duties of the controller or other limitations; eg, surveillance limitations, volume of traffic, frequency congestion, or controller workload. Traffic information does not relieve pilots of their responsibility to see and avoid other aircraft. Pilots are cautioned that there are many times when the controller is not able to give traffic information concerning all traffic in the aircraft's vicinity; in other words, <u>when a pilot requests or is receiving traffic information, he/she should not assume that all traffic will be issued</u>.

Approach trainee comments

The Approach trainee provided the following comments regarding the incident:

- *Workload:* As a result of the above normal traffic conditions, the Approach trainee reported that the workload at the time was high. Also, the trainee's attention was diverted by the Training Commander and Approach Supervisor.

  While the Approach trainee recognised that traffic information could have been passed earlier, if faced with a similar situation in the future, the trainee would not change priorities.
- *Previous experience:* Townsville was the first location the Approach trainee had used the Australian Defence Air Traffic System (ADATS); Pearce used The Australian Advanced Air Traffic System (TAAATS). In addition, while they did not provide a FIS at Pearce, they did provide traffic information to arriving/departing aircraft, but not to the same level as that provided at Townsville.
- *Stress:* The Approach trainee was undergoing a proficiency assessment, which, along with the workload, created a stressful environment.

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7 At altitudes above 10,000 ft in Australia, an aircraft's height above mean sea level is referred to as a flight level (FL). FL220 equates to 22,000 ft.

8 Restricted Areas active at the time were R736AB, R737ABCD, R739AB, R740AB, R741AB and R747.

9 A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights (Aeronautical Information Publication (AIP) General 2.2).

10 An on-request service provided to assist pilots of VFR flights, within ATC surveillance system coverage in Class E and G airspace, to avoid other aircraft or to assist in navigation (AIP General 2.2).

Training Commander comments

When CSG exited Class C airspace, the Approach Training Commander reported that there was about 15 NM lateral and 500 ft vertical separation with XDA. The Training Commander elected not to instruct the Approach trainee to provide traffic information at that time as it would have been more useful to the pilot when CSG and XDA were closer. Furthermore, CSG was not observed climbing as the Training Commander's attention was focused on the aircraft in Class C.

Approach Supervisor comments

The Approach Supervisor reported that CSG was cleared not above 1,000 ft while operating in Class C. However, while entitled to, they did not expect the pilot of CSG to climb above that level when in Class G. In hindsight, they would have passed traffic information between CSG and XDA, however, they believed the respective altitudes were sufficient and they were prioritising conflicts in Class C.

Pilot comments (VH-XDA)

The pilot of XDA provided the following comments regarding the incident and operations at Townsville:

- *Visibility:* When viewed from the cockpit, there would have been no obvious relative movement of CSG,[11] which would have had made it difficult to apply the see-and-avoid principles. Furthermore, as the helicopter (CSG) was at a lower altitude, it may have been obscured by the suburbs and terrain in the background.
- *Attention:* He was in the process of broadcasting a call to company and was maintaining separation with the military helicopter operating in close proximity, which demanded his attention. He prioritised his tasks, but believed he was still maintaining a lookout.
- *Traffic information.* The Approach controllers at Townsville generally provided traffic information, particularly when arriving/departing Class C. This may have resulted in some degree of complacency, with an absence of traffic information inferring nil traffic in the area. If the pilot had received traffic information on CSG, he would have maintained an active lookout for the helicopter.
- *Traffic conditions:* There was a reaonable number of aircraft arriving and departing Townsvillle at the time and the military exercise being conducted appeared to hinder traffic flow management.

Pilot comments (VH-CSG)

The pilot of CSG reported hearing an aircraft operating in the Rollingstone area at 2,500 ft, but was not aware of any other aircraft in the vicinity. He reported that he was maintaining a listening watch of the radio broadcasts, but may have missed a call regarding other traffic as there had been a number of broadcasts made at that time. Despite the amount of radio traffic, the pilot stated that in hindsight, he could have broadcast a call advising of his intentions to climb to 1,500 ft. In addition, the pilot stated that, due to the terrain ahead in his line of sight, he did not observe the aircraft (XDA) until in close proximity.

Department of Defence findings

The Department of Defence conducted an internal investigation into the incident and made the following findings:

- *Supervision:* Supervision from the Approach Supervisor was deemed adequate for the traffic levels experienced.

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[11] Due to the geometry of collision flight paths, an aircraft on a collision course will usually appear to be a stationary object in the pilot's visual field (ATSB publication 'Limitations of See-and-Avoid Principle').

- *R747 diversion:* XDA was operating under IFR, tracking via a VFR diversion on a regularly used VFR route.
- *FIS:* The Approach trainee, Training Commander, and Approach Supervisor were prioritising the provision of air traffic services to aircraft operating in Class C over the provision of a FIS to aircraft operating in Class G. While this led to compromised safety between XDA and CSG, this was not evident to the controllers as the prioritisation of tasks in Class C reduced their situational awareness of the developing situation in Class G.

  Segregation and traffic information was provided between XDA and the military helicopter, however, at that time, XDA and CSG were not an immediate confliction and the focus of the controllers had moved to other tasks.
- *Traffic considerations and proficiency assessment:* The traffic levels at the time resulted in the Approach trainee experiencing a considerable workload, while concurrently undergoing a proficiency assessment. The trainee was prioritising the immediate conflictions, which required continual monitoring of the Class C.

  Furthermore, due to the traffic levels, both the Approach Supervisor and Training Commander were providing input to the Approach trainee. While this was considered necessary, the increased input reduced the trainee's ability to conduct comprehensive scans and continually asses the complete air picture, including the situation in Class G.
- *Error of expectation:* The Approach trainee, Training Commander and Approach Supervisor had expected CSG to continue operating not above 1,000 ft when in Class G as this level was requested by the pilot. However, the pilot of CSG was entitled to change this level when in Class G. The pilot commenced a climb, which occurred over a short period of time and was not detected by the controllers, nor was the proximity of CSG and XDA as the controllers were focusing on other tasks.

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.

Department of Defence

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

- Controllers have been briefed on the importance of providing accurate traffic information to IFR aircraft operating in Class G.
- A training package has been incorporated into the Approach controller training guide to further develop controller understanding of the provision and importance of a FIS.

Safety message

The timely provision of traffic information by ATC assists pilots in gaining an enhanced awareness of the traffic situation. However, pilots should be mindful that the provision of such information is dependent on the category of flight rules (IFR or VFR), the class of airspace, and the workload of the controller at the time. Consequently, pilots should continue to apply both alerted and unalerted see-and-avoid techniques and not rely solely on this service for traffic awareness. This is particularly important when operating in areas such as defined VFR routes. The following ATSB publication provides additional information on see-and-avoid principles: www.atsb.gov.au/publications/1991/limit_see_avoid.aspx

General details

Occurrence details

Occurrence category:	Serious incident	
Primary occurrence type:	Aircraft proximity event	
Location:	22 km WNW of Townsville Airport, Queensland	
	Latitude: 19° 09.08' S	Longitude: 146° 35.97' E

Kawasaki BK117, VH-CSG

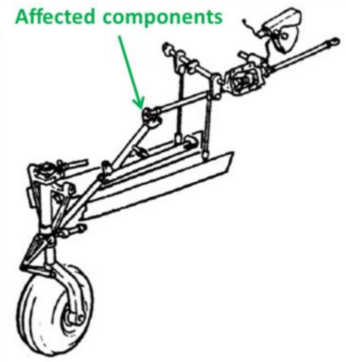
Manufacturer and model:	Kawasaki Heavy Industries BK117 B-1	
Registration:	VH-CSG	
Type of operation:	Private/business	
Persons on board:	Crew – 1	Passengers – Unknown
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Cessna 404, VH-XDA

Manufacturer and model:	Cessna Aircraft Company 404	
Registration:	VH-XDA	
Type of operation:	Air transport – low capacity	
Operator	West Wing Aviation	
Persons on board:	Crew – 1	Passengers – Unknown
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Nose landing gear malfunction involving a Hawker Beechcraft B58, VH-OMS

What happened



Source: Aircraft manufacturer

On 3 April 2013, a Beechcraft B58 (Baron) aircraft, registered VH-OMS (OMS), departed Hervey Bay on a business flight to Toowoomba, Queensland. On board the aircraft were the pilot in command (PIC) and a copilot.

Shortly after take-off, as the landing gear retracted, the crew heard a loud bang. The crew detected a potential issue with the aircraft's landing gear, and, once established in the cruise, began troubleshooting the problem.

The crew noted that the red landing gear transit warning light remained illuminated. They cycled the landing gear on two occasions by selecting up then down, which resulted in the green main landing gear down indicator lights illuminating, but not the nose landing gear (NLG) light. The red transit warning light also remained illuminated. The crew then completed the checklist actions contained in the Aircraft Flight Manual (AFM) in an attempt to manually extend the landing gear, but the green NLG down light did not illuminate.

The crew elected to leave the landing gear extended and continued the flight to Toowoomba, with the intention of conducting a pass over the runway to allow ground personnel to observe and report the condition and position of the NLG. The PIC advised Brisbane Centre air traffic control (ATC) of the situation and his intentions.

The aircraft arrived at Toowoomba and a pass over the runway was conducted at 500 ft. Ground personnel confirmed that the NLG had extended, but was not in the locked position.

The aircraft was flown to the local training area until emergency services were in place at the airport. During this time, the PIC continued to advise ATC and other traffic within the vicinity of the situation. The crew referenced the wheels-up landing procedure in the AFM and formulated a plan, which included the responsibilities of each crew member. The crew then rehearsed the plan in preparation for landing.

After about 45 minutes, the crew were advised that emergency services were in place and the airport was closed. They returned to Toowoomba and elected to conduct a larger than normal circuit pattern. This provided the crew with additional preparation time and ensured that they did not feel rushed.

At about 500 ft above ground level, the aircraft was turned onto the final approach path. During the approach, the PIC elected to utilise engine power for as long as possible to assist with controlling the aircraft's speed and in the event a go-around manoeuvre was required.

As the aircraft's main landing gear touched down, the copilot selected the fuel and mixture controls to off, while the PIC concurrently reduced the throttle settings to idle and turned the electrical system off. The aircraft's nose then lowered and slid along the runway. The aircraft came to a stop and the crew exited. As a precaution, the aircraft was covered with fire retardant foam, but no fire resulted. A video of the landing can be viewed at: www.youtube.com/watch?v=RfX9o6NSKzA

Aircraft information

The aircraft (Figure 1), serial number TH-2347, was built in the United States in 2012 and was first registered in Australia on 29 January 2013. At the time of the occurrence, the aircraft's total time in service was about 87 hours.

Figure 1: VH-OMS after landing

Source: Aircraft maintenance provider

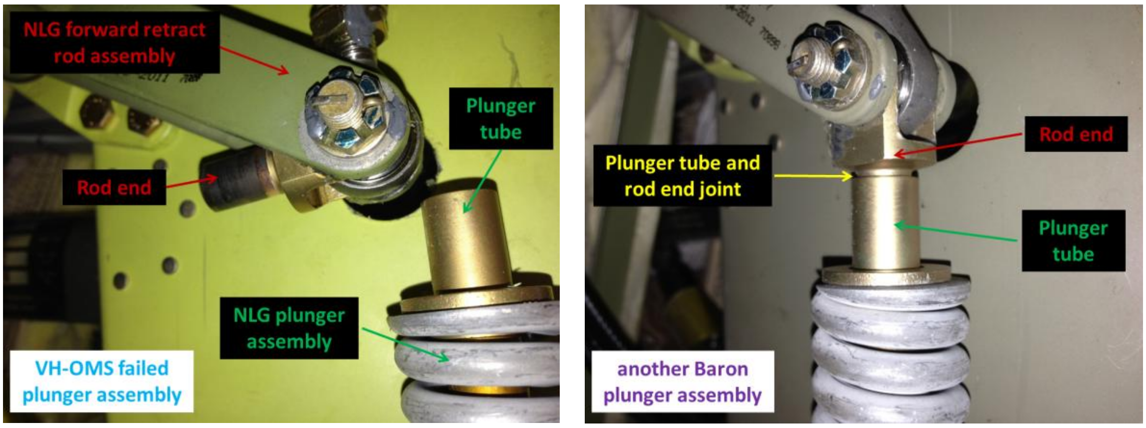
Nose landing gear (NLG) examination

The maintenance provider conducted an examination of the aircraft and determined that the rod end on the NLG forward retract rod assembly had separated from the plunger tube on the NLG plunger assembly (Figure 2). The initial examination suggested that there may have been a manufacturing issue that resulted in a defective join between the rod end and plunger tube.

After the accident involving OMS, the NLG of a second Baron aircraft was inspected and it also showed signs of a similar defect (Figure 2). That aircraft was built in 2012 and had 127 hours total time in service.

The affected components for both aircraft were subsequently removed and sent to the aircraft manufacturer for further examination.

Figure 2: VH-OMS and another Baron rod plunger assembly in situ



Source: Aircraft maintenance provider

Aircraft manufacturer investigation

The affected components were examined by the aircraft manufacturer in the United States, who identified that there was no copper brazing visible on the lower section of the rod end (Figure 3) and inside the plunger tube.

During the manufacturing process, copper braze[1] is placed inside the plunger tube. The rod end is then inserted into the tube, and copper braze is further placed around the tube and rod end joint. The assembly is then placed in a heated chamber where the copper braze melts and 'wicks'[2] into the joint between the rod end and plunger tube. This provides copper penetration into the joint from the outside of the tube and from the inside at the lower end of the fitting.

It was determined that the copper braze had not been placed inside the plunger tube before the rod end had been inserted. This subsequently resulted in the rod end separating from the plunger tube.

Figure 3: VH-OMS rod end

Source: Aircraft manufacturer

The rod-end retract rod assemblies had been previously produced in-house by the aircraft manufacturer; however, in early 2012 this process was contracted to an external supplier. That supplier further outsourced the brazing process.

All new assemblies were required to be 'pull tested' to a 2,200 lb. test load. For the assemblies fitted to OMS, the aircraft manufacturer reported that a pull test had been conducted by the supplier; however, it could not be determined why that test did not reveal the lack of brazing. Two other assemblies manufactured by the supplier were pull tested and failed at about 6,000 lbs; the braze joint did not separate.

The aircraft manufacturer advised that eight of the supplier's retract rod assemblies had left their production quality system either installed in new aircraft or as spare parts, including that fitted to OMS and the other Baron. Seven of those assemblies had since been removed from service; the last assembly had not been located at the time of writing this report. The remaining assemblies manufactured by the supplier, still in the production quality system, had been disposed of. All of the supplier's assemblies were replaced with ones produced in-house.

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.

Hawker Beechcraft

As a result of this occurrence, the aircraft manufacturer has advised the ATSB that they have taken the following safety actions:

- **Mandatory Service Bulletin (MSB):** was released by the aircraft manufacturer on 6 May 2013 as a result of this accident: http://csobeech.com/files/HBC-SB32-4125.pdf. It was issued to inspect for, and if necessary, replace the specified nose landing gear plunger assemblies. This must be accomplished no later than 50 flight hours or 9 months from the issuance of the MSB, whichever occurs first.

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1 Brazing is the process of joining metals by filling a small space between them with molten non-ferrous metal having a melting point above a given arbitrary value.

2 The ability of a liquid to flow in narrow spaced without the assistance of, and in opposition to, external forces like gravity.

The MSB further stated that:

> An improperly brazed rod end might separate from the plunger assembly during landing gear operation. The plunger assembly is part of the NLG extension/retraction system and a separated push-pull retract rod assembly plunger rod end might result in a NLG disconnect from the retraction system that could allow the nose landing gear to collapse on landing.

- **Assembly manufacture:** manufacture of the plunger assembly will now be conducted in-house.
- **Braze specifications:** they are reviewing all braze process specifications and other brazed components manufactured by the supplier.

Safety message

While the crew were faced with an unfortunate situation, this accident highlighted the benefits of using time to your advantage. The crew took the time to formulate a strategy for the landing, assigned responsibilities to each crew member, and then rehearsed the plan. This ensured that they were well prepared and ended in a safe outcome.

General details

Manufacturer and model:	Hawker Beechcraft Corporation G58 (Baron)	
Registration:	VH-OMS	
Type of operation:	Business	
Occurrence category:	Accident	
Primary occurrence type:	Landing gear	
Location:	Hervey Bay, Queensland	
	Latitude: 25° 19.13' S	Longitude: 152° 52.82' E
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

Aircraft proximity event between Piper Chieftain, VH-EDV and Cessna 172 Hawk XP, VH-JQQ

What happened

Piper Chieftain, VH-EDV

Source: Craig Murray

On 17 April 2013, at about 1016 Eastern Standard Time,[1] a Piper PA31-350 aircraft, registered VH-EDV (EDV), was returning from Flinders Island, Tasmania to Moorabbin Airport, Victoria. The flight was a non-scheduled freight charter, conducted under the instrument flight rules (IFR), with two pilots on board. The pilot in command, (PIC), was monitoring the pilot in command under supervision (ICUS) in the left seat.

During the descent to Moorabbin Airport, the aircraft entered visual meteorological conditions (VMC) and the pilot ICUS advised that he intended to track visually via the visual flight rules (VFR) reporting point at Carrum to Moorabbin. He was subsequently advised by Melbourne Centre air traffic control that there was no IFR traffic for the descent.

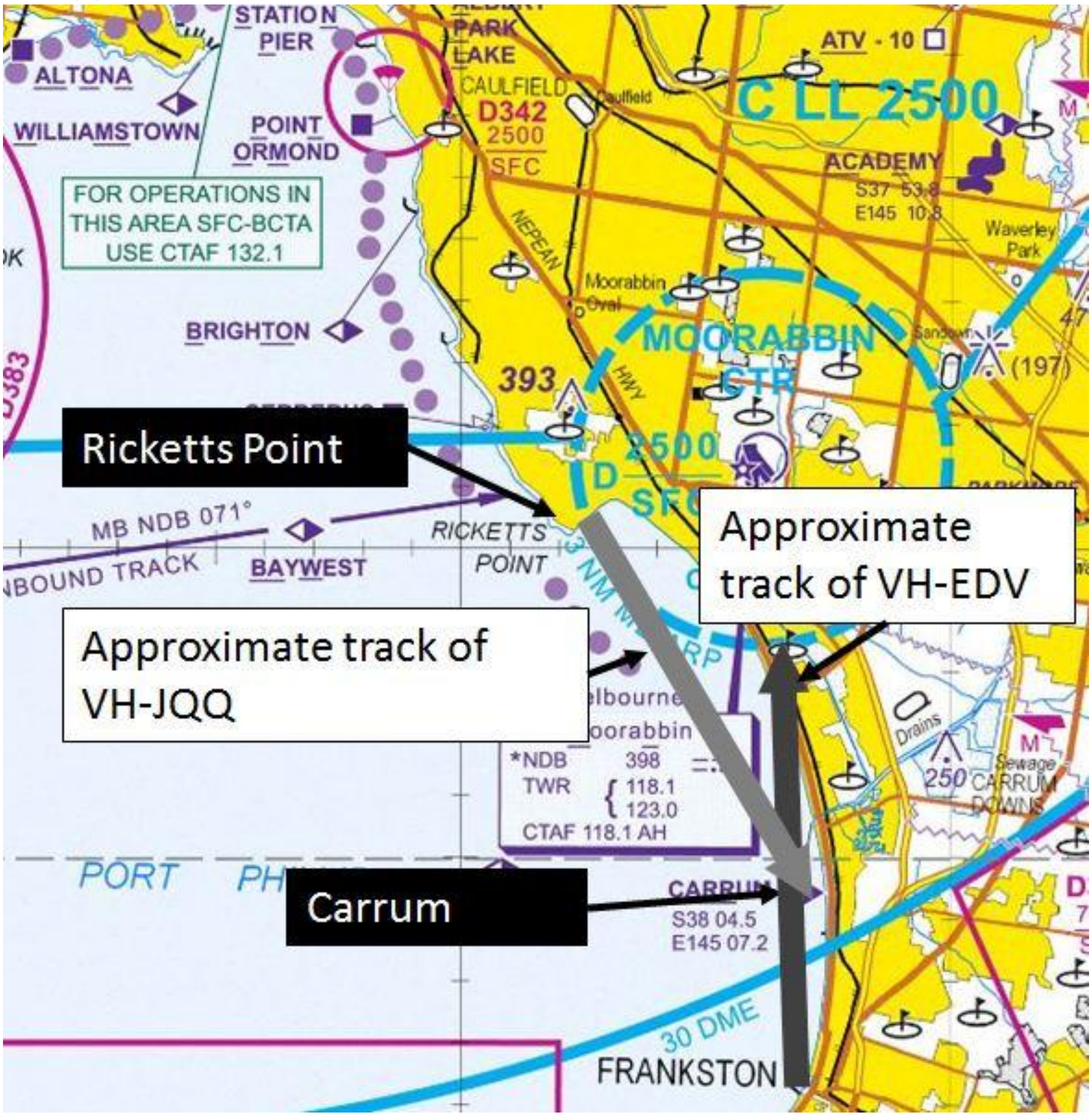
EDV then passed over Frankston, Victoria, on descent through about 2,000 ft above mean sea level.

At about the same time, a Cessna R172K (Hawk XP), registered VH-JQQ (JQQ), had departed Essendon Airport, via the Westgate Bridge and was heading southbound. The crew of the aircraft had completed a routine pipeline inspection in the Essendon control zone, and were in transit via the VFR Coastal Route (Figure 1) at 1,500 ft for another pipeline inspection in the Tyabb, Victoria area.

To remain in gliding distance of the coast, the pilot of the single-engine aircraft JQQ, elected to cross the coastline at Ricketts Point (Figure 1) and obtained a clearance from Moorabbin Tower to transit the western edge of the Moorabbin control zone. JQQ then proceeded to track about 1.5 NM off the coast, from Ricketts Point to Carrum at 1,500 ft.

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

Figure 1: Excerpt from the Melbourne Visual Terminal Chart and approximate tracks of VH-JQQ and VH-EDV



Source: Airservices Australia

The pilot of EDV called Moorabbin Tower at Carrum, at 1,500 ft on a descent profile to arrive at the entry of Moorabbin control zone at the required altitude of 1,000 ft. This call was acknowledged by Moorabbin Tower and the aircraft was cleared to join final approach for runway 35 left (35L) and asked to report at 3 NM.

Less than a minute later, at about 1022, just over 5 NM south-west of Moorabbin, the pilot of JQQ saw EDV on a reciprocal track and the ICUS pilot in EDV saw the lights of JQQ. EDV commenced a descending turn to the right, as JQQ commenced a climb to the right, resulting in JQQ passing over EDV with about 200 ft vertical separation.

Pilot of VH-EDV comments

The PIC of EDV made the following comments:

- He had noticed that the volume on COMM1 was turned down as he had not heard a call clearly. He had hoped that this would trigger the pilot in command under supervision to turn it up.

- They had changed to Moorabbin QNH[2] at top of descent after receiving the Moorabbin Automatic terminal Information Service.[3] They were transferred from Melbourne Centre to Moorabbin Tower at Carrum and given no IFR traffic.
- EDV was at about 1,250 ft at the time of the incident.

Pilot of VH-JQQ comments

The pilot of JQQ made the following comments:

- Shortly after reporting at Ricketts Point, he heard EDV report inbound from Carrum.
- He was not following the suggested VTC route as it is too far away from land to glide in case of engine failure from 1,500 ft, instead he crossed the coast at Ricketts Point then proceeded to track about 1.5 NM off the coast to Carrum.
- The altimeter was reading 1,500 ft and the controller advised that JQQ was on radar at an unverified 1,700 ft.

Publications

The suggested published VFR Coastal Route annotated on the Melbourne VTC (Figure 1) is about 1 NM off the coast, and to allow for the Moorabbin control zone, increases up to about 2NM off the coast from Ricketts Point to Carrum.

The Visual Pilot Guide for the Melbourne Basin (Figure 2) states that aircraft inbound to Moorabbin should track via and report at one of the VFR reporting points at a recommended altitude of 1,500 ft. It also states that aircraft tracking southbound via the Melbourne coastal route should maintain 1,500 ft.

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2 Altimeter barometric pressure subscale setting to provide altimeter indication of height above mean seal level in that area.

3 An automated pre-recorded transmission indicating the prevailing weather conditions at the aerodrome and other relevant operational information for arriving and departing aircraft.

Figure 2: Extract of Visual Pilot Guide: Melbourne coastal route

Source: Civil Aviation Safety Authority

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 JQQ

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

Review of route

The company is looking at the safest route to track from Westgate Bridge to Tyabb and have initiated consultation with Moorabbin Tower to determine the correct altitude for this leg.

Engineering inspection

Engineers serviced the transponder in JQQ.

Safety message

This incident highlights the importance of good flight planning and preparation, in particular complying with tracking instructions for VFR routes. It also highlights the importance of being aware of other aircraft potentially operating in the area, particularly around VFR approach points.

Issues associated with unalerted see-and-avoid have been documented in an ATSB research report *Limitations of the see-and-avoid principle.* Unalerted see-and-avoid relies entirely on the ability of the pilot to sight other aircraft. A traffic search in the absence of traffic information is less likely to be successful than a search where traffic information has been provided because knowing where to look greatly enhances the chance of sighting the traffic. The report is available at www.atsb.gov.au/publications/2009/see-and-avoid.aspx.

General details

Occurrence details

Occurrence category:	Serious incident	
Primary occurrence type:	Aircraft proximity event	
Location:	9 km South of Moorabbin Airport, Victoria	
	Latitude: 38° 03.45' S	Longitude: 145° 04.85' E

Piper Chieftain, VH-EDV

Manufacturer and model:	Piper Aircraft Corporation PA-31	
Registration:	VH-EDV	
Type of operation:	Charter - Freight	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Cessna 172, VH-JQQ

Manufacturer and model:	Cessna Aircraft Company 172	
Registration:	VH-JQQ	
Type of operation:	Aerial work - Survey	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

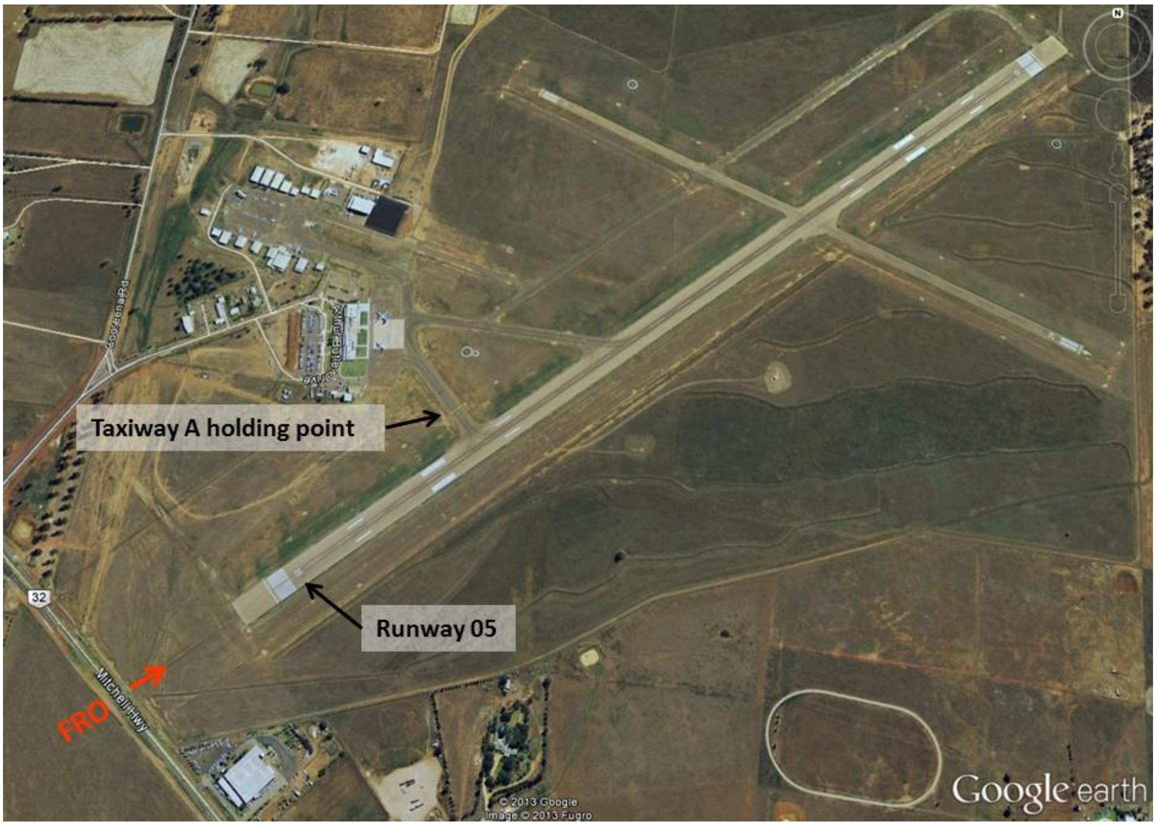
Aircraft proximity event between a Mooney M20, VH-FRO and a Piper PA-31, VH-HJE

What happened

On 2 May 2013, a Mooney M20 aircraft, registered VH-FRO (FRO) was inbound to Dubbo, New South Wales. The pilot was conducting a private flight and was the only person on board. The pilot reported that he broadcast on the Dubbo common traffic advisory frequency (CTAF) at 20 NM and at 10 NM indicating that he was on descent and would join base for runway 05.

At about 1217 Eastern Standard Time,[1] the pilot of a Piper PA-31 aircraft, registered VH-HJE (HJE) was preparing to depart Dubbo. He broadcast on the Dubbo CTAF his intention to conduct an instrument flight rules flight from Dubbo to Lighting Ridge. The pilot and a flight nurse were on board. The pilot taxied via taxiway Alpha (A) to the holding point for runway 05 (Figure 1). At the holding point, the pilot conducted engine run ups and pre-flight checks. At about the same time, a Bonanza aircraft broadcast on the Dubbo CTAF that he was at 20 NM on descent for Dubbo runway 05. The pilot of HJE made contact with the pilot of the Bonanza to indicate his intentions and maintain separation.

Figure 1: Dubbo airport



Source: Google earth

The pilot of FRO reported that he heard the pilot of HJE's broadcasts and when he broadcast that he was on final for runway 05, he saw HJE stationary at the holding point.

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

At about 1220, the pilot of HJE had completed the engine run ups and broadcast his intention to enter and back track to runway 05. Before the aircraft commenced moving, the pilot reported that he looked down the flight path of runways 05 and 23 and did not see any aircraft. He stated that he had not heard any broadcasts from FRO.

On short final, at about 200 feet above ground level (AGL), the pilot of FRO heard the broadcast from HJE and saw HJE move. At the same time, the pilot of HJE spotted an aircraft, which was previously obscured by the aircraft's window frame, on short final for runway 05 and brought HJE to a stop. The pilot of FRO applied full power and commenced a go-around.

The pilot of HJE broadcast on the Dubbo CTAF and Narromine CTAF trying to contact FRO without success. The pilot of HJE contacted the Bonanza on the CTAF and informed him of the presence of FRO in the circuit area and the Bonanza acknowledged HJE's broadcast that he had sighted FRO.

The pilot of HJE indicated that when he had both FRO and the Bonanza visual he entered, backtracked and departed runway 05 making the appropriate broadcasts on the CTAF.

The pilot of FRO could hear over the radio that the inbound Bonanza had him visual and completed the circuit and landed without incident, making all the appropriate radio calls.

Pilot FRO comments

The pilot of FRO reported that he could hear his voice clearly through the headset and had communicated without issue with another aircraft as he was taxiing at Manuka Station airstrip, New South Wales. Also when he made his 20 NM broadcast, he reported that he heard the aerodrome frequency response unit 'Dubbo aerodrome', which indicated that his broadcast was received by the unit.

The pilot reported he had his radio system inspected at Dubbo after the incident and it was determined that a radio communication switch was faulty, resulting in no broadcasts being made from the aircraft on that communication system.

Pilot HJE comments

The pilot of HJE believed that he was only just past the holding point of taxiway A before the aircraft came to a stop. He had not heard any radio broadcasts from FRO and had tried to contact him on the Dubbo CTAF and another local CTAF, when he became aware of his presence.

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-HJE

As a result of this occurrence, the aircraft operator of VH-HJE has advised the ATSB that they are taking the following safety actions:

Notice to pilots

The operator has issued a notice to all company pilots to ensure an effective lookout prior to entering a runway at non-controlled aerodromes, regardless of nil activity on the CTAF frequency.

Owner of VH-FRO

As a result of this occurrence, the aircraft owner of VH-FRO advised the ATSB that the radio system was repaired before further flight.

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. One of the safety concerns is safety around non-towered aerodromes. www.atsb.gov.au/safetywatch/safety-around-aeros.aspx

As is highlighted by this incident and other occurrences reported to the ATSB, some aircraft may not have a radio that is working or is tuned to the correct frequency. There may be a variety of aircraft of different sizes and performance levels all operating at the same time in the same airspace. It is important to not rely solely on monitoring your radio to achieve traffic awareness.

The ATSB has issued a publication called *A pilot's guide to staying safe in the vicinity of non-towered aerodromes* which outlines many of the common problems that occur at non-towered aerodromes, and offers useful strategies to keep yourself and other pilots safe. The publication is available at www.atsb.gov.au/publications/2008/ar-2008-044(1).aspx .

In addition, the Civil Aviation Safety Authority (CASA) has produced several publications and resources that provide important safety advice for operations at, or in the vicinity of non-towered aerodromes see www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_100058 .

General details

Occurrence details

Occurrence category:	Incident	
Primary occurrence type:	Aircraft proximity event	
Location:	Dubbo Airport, New South Wales	
	Latitude: 32° 13.00'S	Longitude: 148° 34.48'E

VH-FRO

Manufacturer and model:	Mooney M20	
Registration:	VH-FRO	
Type of operation:	General aviation	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

VH-HJE

Manufacturer and model:	Piper PA-31	
Registration:	VH-HJE	
Type of operation:	Charter	
Persons on board:	Crew – 2	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Two airspace related events at Nagambie (ALA)

What happened

The ATSB was advised of two airspace related events in the vicinity of the Nagambie aeroplane landing area (ALA), Victoria on 3 and 8 May 2013. The first incident on 3 May 2013 was an aircraft proximity event between VH-FZW and VH-EFY. The second incident on 8 May 2013 involved VH-CHA, which was observed to pass in proximity to airborne parachutists.

Occurrence 1

VH-FZW and VH-EFY

Pilot recollection

On 3 May 2013, the pilot of a Cessna 182 aircraft, registered VH-EFY (EFY), was conducting parachute operations overhead Nagambie (ALA), Victoria. While taxiing, the pilot of EFY reported hearing a taxi call on the Mangalore/Nagambie common traffic advisory frequency (CTAF) from the pilot of an aircraft operating at Mangalore. Soon after, the pilot of EFY broadcast a call advising he was rolling on runway 23. After take-off, the pilot broadcast another call on the CTAF and Melbourne Centre Low frequency[1] advising that he had departed and was on climb to flight level (FL)[2] 120 to conduct a parachute drop overhead Nagambie (ALA). During the climb, the pilot contacted Melbourne Centre High air traffic control and received a clearance to climb to FL 120.[3]

At about the same time, the pilot of a Piper PA-28 aircraft, registered VH-FZW (FZW), broadcast on the CTAF advising he was taxiing at Mangalore. The pilot was conducting a private ferry flight from Mangalore to Bendigo. Shortly after takeoff, he broadcast another call advising he had departed Mangalore. The pilot planned to track from Mangalore to the Nagambie Township and then to Bendigo, to avoid a Restricted Area,[4] R351, and a parachute operations Danger Area,[5] D360 (Figure 1). The pilot also reported hearing a broadcast from an aircraft operating in the Nagambie area, but was not aware of that aircraft's intentions.

In preparation for the parachute drop, the pilot of EFY broadcast a '4 minutes to drop' call on the CTAF and Melbourne Centre Low frequency; a '3 minute to drop' call on the Melbourne Centre High frequency and a '1 minute to drop' call on the CTAF. After completing the drop, the pilot broadcast a call on the CTAF, the Melbourne Centre High and Melbourne Centre Low frequencies advising that the drop had been completed and the aircraft was on descent.

The pilot of EFY conducted a circling descent, about 5 NM to the west of the Nagambie ALA. The boundary of the Danger Area is a 3 NM radius around the ALA and the aircraft's descent is not wholly contained in that area. EFY joined the base leg of the circuit for runway 02 at Nagambie, at about 4,500 ft, and made a broadcast on the CTAF.

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1 Melbourne Centre Low frequency is used for operations below 8,500 ft, while operations conducted above 8,500 ft use the Melbourne Centre High frequency.

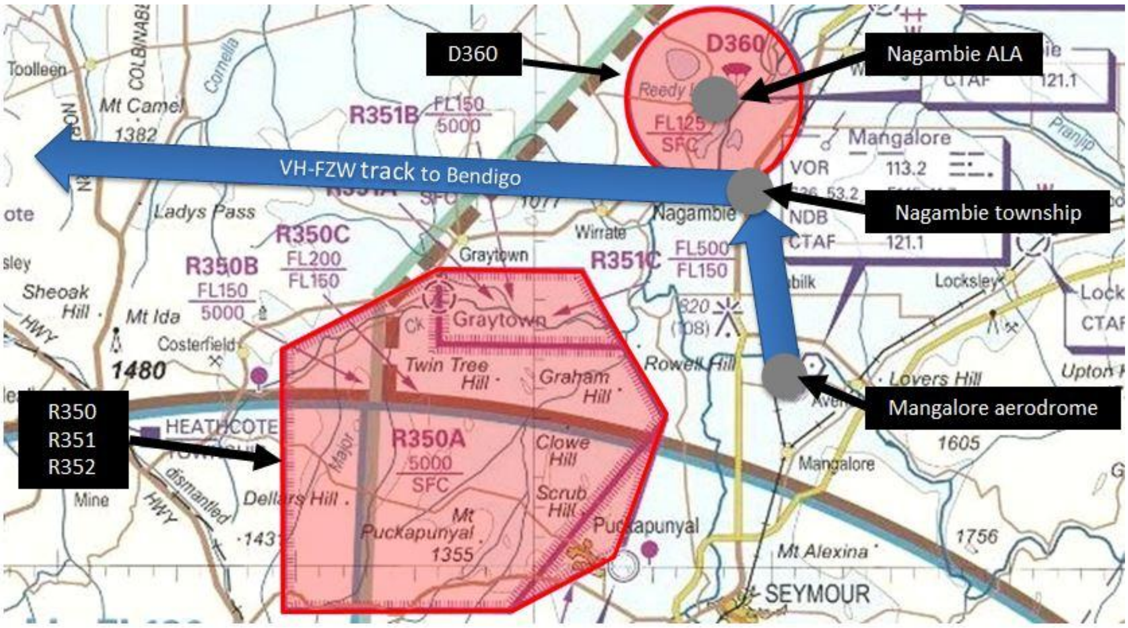
2 At altitudes above 10,000 ft, an aircraft's height above mean sea level is referred to as a flight level (FL). FL 120 equates to 12,000 ft.

3 The aircraft was fitted with two radio systems (COMM 1 and COMM 2). The pilot reported that COMM 1 was used to broadcast and monitor the Melbourne Centre frequencies, while the CTAF was selected on COMM 2.

4 An airspace of defined dimensions above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions (Aeronautical Information Publication GEN 2.2 Section 1).

5 An airspace of defined dimensions within or over which activities of potential danger to aircraft flying over the area may exist (Aeronautical Information Publication GEN 2.2 Section 1).

Figure 1: VH-FZW planned track and the Nagambie area



Source: Airservices Australia

The pilot of FZW reported that he was about 6-7 NM to the west of the Nagambie Township, maintaining 2,500 ft, when he observed an aircraft (EFY) above, on descent, tracking from left to right. The pilot immediately banked left 10-15° and pitched 10° nose down. He reported that FZW flew about 100 ft below EFY.

The pilot of EFY reported that, as he re-entered the Danger Area, descending through 2,000 ft, he sighted an aircraft (FZW) in his 12 o'clock[6] position taking avoiding action. The pilot banked the aircraft heavily to avoid FZW and estimated the aircraft came within 50 ft of each other.

After the incident, the pilot of EFY attempted to contact FZW on the CTAF. The pilot of EFY stated that he did not receive a response to any of his calls made on the CTAF.

The pilot of FZW reported that he normally changed from the CTAF to the Melbourne Centre Low frequency when overhead the Nagambie Township, however, he could not recall when he changed frequencies on that flight. He did not hear any broadcasts from the pilot of EFY.

Occurrence 2

VH-CHA and parachutists

On 8 May 2013, the pilot of a Bell 206 helicopter, registered VH-CHA (CHA), was preparing for a private flight from Mangalore to Echuca, Victoria. In preparation for the flight, the pilot obtained knowledge of the area from a local pilot and discussed the Restricted Areas. The pilot planned to track via the Nagambie Township to avoid the Restricted Areas to the west of Mangalore (Figure 1). The pilot reported being aware of the Nagambie ALA Danger Area (D360), but was not aware of the scale of parachute operations in the area.

The pilot of CHA made a broadcast at Mangalore on the Mangalore / Nagambie CTAF advising he was taking off parallel to runway 05 and tracking to the north. After receiving a response from an aircraft in the circuit, he made a call to that aircraft advising he would track to the east to remain clear.

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6 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.

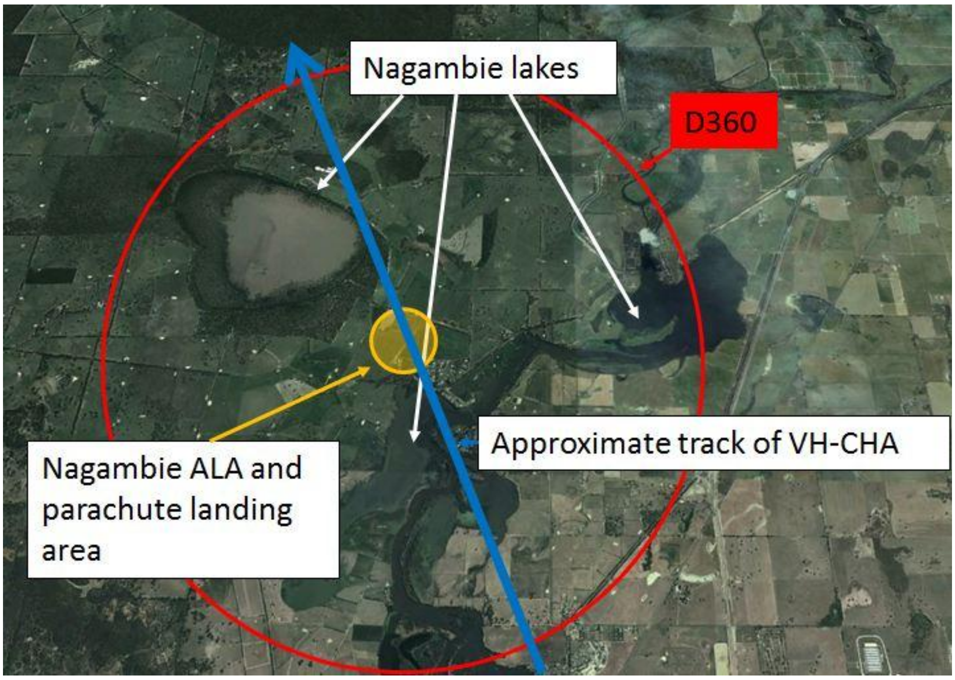
The helicopter departed Mangalore and commenced tracking for the Nagambie Township and subsequently turned more westerly on a track to Echuca, maintaining 1,000 ft.

At about the same time, the pilot of parachuting aircraft, registered VH-XLS (XLS), broadcast taxi and rolling calls on the Mangalore / Nagambie CTAF. The aircraft then departed on climb to FL145. The pilot reported broadcasting the following calls: airborne on the CTAF and Melbourne Centre Low frequency; a call to Melbourne Centre High for an airways clearance; ‘4 minutes to drop’ on the CTAF and Melbourne Centre Low; ‘3 minutes to drop’, and a clearance request to drop and descend on Melbourne Centre High and a ‘1 minute to drop’ call on the CTAF. After the drop had been completed, the pilot broadcast on the CTAF, Melbourne Centre High and Melbourne Centre Low that the aircraft was on descent and inbound to Nagambie.

After passing in the vicinity of the Nagambie Lakes area (Figure 2), the pilot of CHA received a call on the CTAF from the drop zone safety officer on the ground at Nagambie ALA advising him that he had just flown over a parachute landing area. At that time, five parachutists had just landed and six were still airborne, operating below 2,000 ft. The safety officer reported observing CHA transit the Danger Area in a north-westerly direction at an estimated 500 ft. The pilot of CHA reported that he transited the zone at 1,000 ft.

The pilot of the parachuting aircraft reported that he normally made a joining circuit call on the CTAF. However, on this flight, the drop zone safety officer was contacting CHA on the CTAF at that time.

Figure 2: Nagambie Lakes and D360



Source: Google earth

Pilot comments (VH-CHA)

The pilot of CHA provided the following comments regarding the incident:

- he would have avoided transiting the Danger Area if he had known parachute operations were active at the time
- he did not recall hearing any broadcasts from the drop aircraft
- he had become distracted by the scenery and by talking to his passenger while looking at the Nagambie Lakes area
- his priority was to avoid the restricted area, which removed his focus from the danger area

Pilot comments (VH-XLS)

The pilot of XLS suggested that the comments about the Danger Area, as published in the En Route Supplement Australia (ERSA), be printed on the relevant charts. In this instance, the text "Intense PJE OPS SFC-FL145 WI 3NM HJ 7 days a week" could be printed within the Danger Area identified on the Visual Navigation Chart (VNC) or in the margin.

Nagambie parachute operations

Due to the regularity of parachute operations at the Nagambie ALA, the area had been classified as a Danger Area (D360). The Airservices Australia Designated Airspace Handbook stated that the lateral limit of D360 was a 3 NM radius from the ALA and the vertical limit was from the surface to FL125, with parachuting operations conducted from sunrise to sunset.

The En Route Supplement Australia extract for Nagambie also stated that that there was intense parachute operations within 3 NM, 7 days per week up to FL140. In addition, parachuting aircraft would broadcast calls on the CTAF, the Melbourne Centre Low and Melbourne Centre High frequencies.

Safety message

The Aeronautical Information Publication ENR 1.4 paragraph 5.3.5 stated that:

> Approval for flight within an active Danger Area outside controlled airspace is not required. However it is the responsibility of the PIC [pilot in command] to be aware of the dangerous activity and take appropriate precautions.

It is crucial that pilots are aware of the potential hazards that exist on their planned flight routes. When operating near, or within a Danger Area, they should be mindful of the activity within that area and take any appropriate precautions.

Issues associated with unalerted see-and-avoid have been documented in an Australian Transport Safety Bureau (ATSB) research report *Limitations of the See-and-Avoid Principle*. Unalerted see-and-avoid relies entirely on the ability of the pilot to sight the other aircraft. A traffic search in the absence of traffic information is less likely to be successful than a search where traffic information has been provided because knowing where to look greatly increases the chance of sighting the traffic.

The *Limitations of See-and-Avoid Principle* is available at

www.atsb.gov.au/publications/2009/see-and-avoid.aspx

Research published by the Australian Transport Safety Bureau determined that, between 1997 and 2004, pilot distraction was cited in 325 occurrences. The distraction source was identified in 237 of these, with some having multiple sources. Therefore, the number of distractions identified was 247. Of this, 7.3 per cent were attributed to passengers, with the majority caused by passenger commentary and interactive conversations between the pilot and the passenger. This incident is a reminder to pilots to be mindful of the impact distractions can have on aircraft operations. A copy of the ATSB Research report is available on the ATSB website here: www.atsb.gov.au/publications/2005/distraction_report.aspx

General details

Occurrence 1 details

Occurrence category:	Incident	
Primary occurrence type:	Aircraft proximity event	
Location:	near Nagambie (ALA), Victoria	
	Latitude: 36° 44.2' S	Longitude: 145° 07.6' E

Piper PA-28, VH-FZW

Manufacturer and model:	Piper Aircraft Corporation PA-28-151	
Registration:	VH-FZW	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Cessna 182, VH-EFY

Manufacturer and model:	Cessna Aircraft Company 182L	
Registration:	VH-EFY	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Occurrence 2 details

Occurrence category:	Incident	
Primary occurrence type:	Airspace event	
Location:	near Nagambie (ALA), Victoria	
	Latitude: 36° 44.2' S	Longitude: 145° 07.6' E

Bell 206, VH-CHA

Manufacturer and model:	Bell Helicopter Textron Canada Ltd. 206B	
Registration:	VH-CHA	
Type of operation:	Private	
Persons on board:	Crew – 1	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

Collision with terrain involving a Pietenpol Air Camper, VH-ARW

What happened

Location of operating area

Source: Google Earth

On 19 May 2013 at about 1400 Eastern Standard Time,[1] the pilot of a Pietenpol Air Camper, registered VH-ARW (ARW), (Figure 1) commenced pre-flight checks in a paddock behind his home in St Leonards, about 9 km north of Launceston Airport, Tasmania. The pilot was taking a passenger on a scenic flight around Launceston.

The pilot had operated ARW from the paddock in the past, but not for a few years. Prior to landing in the paddock, a week earlier, the pilot had surveyed the area by car.

The aircraft was operating normally and became airborne at about 1427 at about 35 knots indicated airspeed. The pilot held the aircraft low, aiming to clear a fence at the end of the paddock. Nearing the fence, the pilot heard a loud noise and the nose of the aircraft jolted to the right.

The airspeed quickly decreased, as the pilot attempted to hold the wings level. After initially climbing to about 10 ft, ARW impacted the ground, breaking the landing gear. The aircraft skidded on its nose and then pitched over onto its back, breaking the propeller.

Figure 1: VH-ARW prior to the accident

Source: Aircraft owner

Both the pilot and the front seat passenger exited the aircraft without injury. On surveying the accident site, the pilot realised the aircraft's landing gear had caught the top wire of an electric fence he had not been aware of, located a short distance before the paddock's main fence.

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

Safety message

When not operating from a designated landing area, pilots should ensure the area is suitable. A thorough survey of the area to be used for take-off and landing should be completed prior to use.

General details

Manufacturer and model:	Amateur Built 1933 Pietenpol Air Camper	
Registration:	VH-AWR	
Type of operation:	Private	
Occurrence category:	Accident	
Primary occurrence type:	Collision with terrain	
Location:	St Leonards, 9 km N Launceston, Tasmania	
	Latitude: 41° 27.73' S	Longitude: 147° 13.33' E
Persons on board:	Crew – 1	Passengers – 1
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Minor	

Australian Transport Safety Bureau

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; 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.

Purpose of safety investigations

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. The terms the ATSB uses to refer to key safety and risk concepts are set out in the next section: Terminology Used in this Report.

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 Bulletin

The ATSB receives around 15,000 notifications of Aviation occurrences each year, 8,000 of which are accidents, serious incidents and incidents. It also receives a lesser number of similar occurrences in the Rail and Marine transport sectors. It is from the information provided in these notifications that the ATSB makes a decision on whether or not to investigate. While some further information is sought in some cases to assist in making those decisions, resource constraints dictate that a significant amount of professional judgement is needed to be exercised.

There are times when more detailed information about the circumstances of the occurrence allows the ATSB to make a more informed decision both about whether to investigate at all and, if so, what necessary resources are required (investigation level). In addition, further publically available information on accidents and serious incidents increases safety awareness in the industry and enables improved research activities and analysis of safety trends, leading to more targeted safety education.

The Short Investigation Team gathers additional factual information on aviation accidents and serious incidents (with the exception of 'high risk operations), and similar Rail and Marine occurrences, where the initial decision has been not to commence a 'full' (level 1 to 4) investigation.

The primary objective of the team is to undertake limited-scope, fact gathering investigations, which result in a short summary report. The summary report is a compilation of the information the ATSB has gathered, sourced from individuals or organisations involved in the occurrences, on the circumstances surrounding the occurrence and what safety action may have been taken or identified as a result of the occurrence.

These reports are released publically. In the aviation transport context, the reports are released periodically in a Bulletin format.

Conducting these Short investigations has a number of benefits:

- Publication of the circumstances surrounding a larger number of occurrences enables greater industry awareness of potential safety issues and possible safety action.
- The additional information gathered results in a richer source of information for research and statistical analysis purposes that can be used both by ATSB research staff as well as other stakeholders, including the portfolio agencies and research institutions.
- Reviewing the additional information serves as a screening process to allow decisions to be made about whether a full investigation is warranted. This addresses the issue of 'not knowing what we don't know' and ensures that the ATSB does not miss opportunities to identify safety issues and facilitate safety action.
- In cases where the initial decision was to conduct a full investigation, but which, after the preliminary evidence collection and review phase, later suggested that further resources are not warranted, the investigation may be finalised with a short factual report.
- It assists Australia to more fully comply with its obligations under ICAO Annex 13 to investigate all aviation accidents and serious incidents.
- Publicises ***Safety Messages*** aimed at improving awareness of issues and good safety practices to both the transport industries and the travelling public.

Australian Transport Safety Bureau

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Investigation

ATSB Transport Safety Report
Aviation Short Investigations
Aviation Short Investigation Bulletin Issue 21
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Final – 7 August 2013