

Australian Government Australian Transport Safety Bureau

# Collision with terrain involving Gulfstream 695A, VH-HPY

30 NM south-east of Cloncurry, Queensland on 4 November 2023

**ATSB Transport Safety Report** 

Aviation Occurrence Investigation AO-2023-053 Preliminary – 7 February 2024 Released in accordance with section 25 of the Transport Safety Investigation Act 2003

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#### Addendum

Page	Change	Date

# **Preliminary report**

This preliminary report details factual information established in the investigation's early evidence collection phase and has been prepared to provide timely information to the industry and public. Preliminary reports contain no analysis or findings, which will be detailed in the investigation's final report. The information contained in this preliminary report is released in accordance with section 25 of the *Transport Safety Investigation Act 2003*.

# The occurrence

On 4 November 2023, a Gulfstream 695A, registered VH-HPY, was being operated by AGAIR on an instrument flight rules<sup>1</sup> flight from Toowoomba, Queensland to Mount Isa. On board the aircraft were the pilot and 2 camera operators. The purpose of the flight was to conduct aerial photography of fire zones located north of Mount Isa. The flight had been contracted by Queensland Fire and Emergency Services and was conducted as an aerial work operation.

At about 1055 local time, the aircraft departed Toowoomba Airport. The pilot was provided with an air traffic control clearance to track to Mount Isa. They were initially cleared to climb to flight level<sup>2</sup> (FL) 160, and then were issued further instructions to continue the climb to the planned cruise of FL 280. The pilot made a brief personal phone call at about 1106, and the aircraft reached FL 280 at 1120:30 (Figure 1).



#### Figure 1: Flight path overview

Source: Google Earth, annotated by the ATSB

<sup>&</sup>lt;sup>1</sup> Instrument flight rules (IFR) are a set of regulations that permit the pilot to operate an aircraft in instrument meteorological conditions (IMC), which have much lower weather minimums than visual flight rules (VFR).

<sup>&</sup>lt;sup>2</sup> 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 280 equates to 28,000 ft.

At 1141:12, the pilot contacted the controller and requested clearance to descend to FL 150. The requested clearance was provided and, a short time later, the aircraft started to descend. The initial rate of descent reached about 3,900 feet per minute (ft/m), but this slowed as the aircraft continued to descend. At 1151:49, the aircraft levelled off at FL 150. At 1157:43, the pilot contacted the controller again and requested clearance to climb back to FL 280, which was approved. Shortly after, the aircraft began to climb.

At 1210:19, the flight was transferred to, and the pilot established radio communication with, the controller responsible for the Simpson region<sup>3</sup> on a frequency of 126.0 MHz. The pilot reported to the controller that the aircraft was on climb to FL 280. At 1221:49, the aircraft levelled off at FL 280.

At 1245:51, the controller requested the pilot change frequency to 122.1 MHz, to maintain radio contact within range of ground equipment. This change was acknowledged by the pilot, but the Simpson region controller did not receive radio communications from the flight on the newly assigned frequency.

Between 1247:51 and 1340:15 the Simpson region controller made 15 separate radio broadcasts attempting to re-establish radio communication with the pilot. The controller also attempted to contact the pilot on HF (high frequency) radio and by relaying messages via other aircraft that were operating in the same area as VH-HPY.

At 1318:20, the controller declared an uncertainty phase (INCERFA)<sup>4</sup> for the aircraft.

At 1341:31, the pilot called the Simpson region controller on 122.1 MHz, providing callsign, flight level and radio frequency, but the controller was unable to re-establish two-way communications. Between 1341:31 and 1350:51 the controller continued attempts to contact the pilot. This included further attempted communication relays via aircraft in the vicinity of VH-HPY on various frequencies including the international air distress frequency of 121.5 MHz. At 1350:51 a crewmember on board a Royal Australian Air Force (RAAF) Alenia C-27J Spartan aircraft was able to establish contact with the pilot on 118.6 MHz.

At 1351:08, the controller requested that the RAAF crewmember instruct the pilot to call them on 123.95 MHz. At 1351:59, the controller re-established radio communications with the pilot of VH-HPY on this frequency. The pilot confirmed the aircraft was maintaining FL 280 and was 'ops normal'. Between 1352:08 and 1357:34 several communications took place between the controller and the pilot during which the pilot advised the aircraft's oxygen system was operating normally. The pilot informed the controller that the aircraft was tracking direct to Cloncurry and then on to an area near Mount Gordon to undertake airwork.

At 1357:34, the pilot was provided with an air traffic control clearance to undertake operations near Mount Gordon. Between 1357:43 and 1401:36 the pilot repeated the clearance from the controller 4 times, seeming uncertain about the status of the clearance. Although a formal speech analysis has not been undertaken at this stage, radio recordings during this period indicate that the pilot's rate and volume of speech had substantially lowered from earlier communications and was worsening. During the last radio transmission, which commenced at 1401:23, the pilot seemingly had difficulty pronouncing the location 'Cloncurry' and they incorrectly stated the airwork would take place near 'Mount Ball', which was then corrected to 'Gordon'.

At 1419:22, the controller requested the pilot change frequency to 122.4 MHz, but no response was received. Between 1420:05 and 1427:20 the controller attempted to contact the pilot 8 times without receiving a response.

<sup>&</sup>lt;sup>3</sup> An area covering the central and western parts of Queensland.

<sup>&</sup>lt;sup>4</sup> A situation where uncertainty exists as to the safety of an aircraft and its occupants. In this instance, an uncertainty phase is declared when a pilot fails to report to air traffic control 30 minutes after a frequency change.

The aircraft was not fitted with a cockpit voice recorder or flight data recorder. However, flight data was transmitted to ground stations by aircraft/navigational equipment (see *Recorded information*). This data indicated that at 1420:50 the aircraft's groundspeed began to reduce from a cruise groundspeed of about 225 kt (417 km/h), while heading and altitude remained steady. At 1425:25, the groundspeed had decreased to about 104 kt (193 km/h) and the aircraft departed controlled flight. The aircraft initially entered a descending anticlockwise<sup>5</sup> turn with an increasing rate of descent. At an altitude of about 10,000 ft, the aircraft transitioned into a tight clockwise helical descent, likely an aerodynamic spin,<sup>6</sup> with a subsequent average rate of descent of about 13,500 ft/m (Figure 2).



#### Figure 2: Oblique view of the aircraft's flight path during the descent from FL 280

Source: Google Earth, annotated by the ATSB

Two witnesses at a nearby mining facility observed the aircraft's descent and described hearing a 'whirring' noise and seeing it descending in a nose-down clockwise corkscrew motion. The witnesses recalled the aircraft's motion momentarily abated partway down, before it re-entered the nose-down corkscrew descent.

At about 1427:20, the aircraft collided with terrain 30 NM (56 km) south-east of Cloncurry. The 3 occupants were fatally injured, and the aircraft was destroyed by impact forces and a fuel-fed post-impact fire.

# Context

#### **Pilot information**

The pilot held a valid class 1 aviation medical certificate and an air transport pilot licence (aeroplane). At the time of the accident, the pilot had about 4,800 hours total aeronautical experience. This included about 3,200 hours operating turbine/jet aircraft including the Beechcraft

<sup>&</sup>lt;sup>5</sup> Directions given are from a top-down perspective.

<sup>&</sup>lt;sup>6</sup> A sustained spiral descent of a fixed-wing aircraft, with the wing's angle of attack beyond the stall angle.

B200, Learjet L35/36, and several high-performance military aircraft. The pilot commenced employment with the aircraft operator in September 2023.

#### Camera operator information

Camera operator 1 joined the aircraft operator in July 2021. They were not employed as a pilot by the organisation, but held a valid class 1 aviation medical certificate and commercial pilot licence (aeroplane). At the time of the accident, they had about 434 hours total aeronautical experience, including 72 hours on multi-engine piston aircraft. The ATSB has not yet determined whether camera operator 1 was in the second pilot's seat at the time of the accident.

Camera operator 2 was a United States citizen who had experience in the construction and operation of the imaging system. They joined the aircraft operator in October 2023.

#### Aircraft information

The Gulfstream 695A is a high-wing, pressurised, twin-engine aircraft powered by 2 Garrett TPE331-10-511K turboprop engines, and is fitted with a system to provide oxygen to the occupants in the event of a depressurisation at high altitudes. The aircraft was designed as a business and personal aircraft with seating capacity of up to 11 depending on configuration. The aircraft, serial number 96051, was manufactured in 1982 and first registered in Australia as VH-HPY on 11 November 2014. Its registration was held by AGAIR from 14 September 2016.

In 2021, VH-HPY was fitted with a long-wave infrared imaging system to carry out aerial photography of fire zones.

The aircraft's most recent scheduled maintenance was completed on 1 November 2023, and at that time it had accrued 7,566.1 hours total time in service. Work carried out included the 150 hourly inspection and the rectification of minor defects.

#### Site and wreckage information

The ATSB conducted an on-site examination of the aircraft wreckage. The aircraft came to rest in flat, open bushland and was destroyed by a significant post-impact fire (Figure 3). The post-impact fire damage limited the extent to which pre-impact defects could be identified, however from the evidence available:

- all major aircraft components were accounted for at the point of impact
- the impact marks and wreckage position indicated that the aircraft impacted terrain upright with a shallow, nose down attitude and with little forward momentum, indicative of a spin
- both engines and propellers had indications that the engines were running at impact.

It was not possible to determine the operability of the aircraft's pressurisation and oxygen systems.



Figure 3: Overview of the accident site

Source: Queensland Police, annotated by the ATSB

### Weather information

Preliminary examination of meteorological records for the accident area indicated that the conditions present at FL 280 at the time of the accident were likely a westerly wind at 40 kt, with no significant weather events nearby.

At 1430, about 3 minutes after the aircraft collided with terrain, the Bureau of Meteorology (BoM) automatic weather station at Cloncurry, 56 km north-west of the collision location, recorded the surface wind as 6 KT from 190° true, visibility greater than 10 km, no detected cloud, temperature 40°, dew point 2°, and no rainfall since 0900 local time.

# Recorded information

During the flight, data was being transmitted by the aircraft's automatic dependent surveillance broadcast (ADS-B) equipment. This data, recorded at intervals of less than 1 second, captured the aircraft's position and altitude shortly after departure from Toowoomba until the aircraft had descended to about FL 240 during its final descent. Flight data was also being transmitted from a navigational application on a tablet onboard the aircraft's position, altitude, groundspeed and heading.

All radio communications made and received by Airservices Australia throughout the entirety of VH-HPY's flight were recorded.

A Garmin GTN-750 navigation system was recovered from the accident site and transported to the ATSB's Canberra technical facility. Examination of the unit indicated that it was not recording flight data.

# **Further investigation**

To date, the ATSB has:

- examined the wreckage and accident site
- examined the Garmin GTN750 navigation system recovered from the accident site
- interviewed relevant parties
- collected radio communication, aircraft traffic surveillance data, and navigational application
  data
- collected aircraft, pilot, crew and operator documentation.

The investigation is continuing and will include further analysis of:

- the pilot's speech during radio communications, including an examination of hypoxia indicators<sup>7</sup>
- meteorological information
- maintenance records, including those of the aircraft's pressurisation and oxygen systems, and airworthiness procedures
- operational procedures and documentation
- flight data and air traffic surveillance data
- pilot and crew training and medical records.

A final report will be released at the conclusion of the investigation. Should a critical safety issue be identified during the course of the investigation, the ATSB will immediately notify relevant parties so appropriate and timely safety action can be taken.

# Acknowledgement

The ATSB would like to acknowledge the significant assistance provided by the Queensland Police Service during the on-site investigation phase and initial evidence collection activities.

<sup>&</sup>lt;sup>7</sup> Hypoxia is the result of a lack of oxygen to the body tissues. The most common type of hypoxia in aviation is altitude (hypobaric) hypoxia, which can be prevented by pressurising the aircraft or by breathing supplemental oxygen. Symptoms can be insidious and include sleepiness, drowsiness, slurred and slowed speech, confusion, and impaired cognition and decision making.

# **General details**

# **Occurrence details**

Date and time:	4 November 2023, 1427 Eastern Australia Standard Time		
Occurrence class:	Accident		
Occurrence categories:	Collision with terrain		
Location:	29.6 NM 124.5 degrees from Cloncurry Airport, Queensland		
	Latitude: 20.9427° S	Longitude: 140.9410° E	

# **Aircraft details**

Manufacturer and model:	Gulfstream American Corporation 695A		
Registration:	VH-HPY		
Operator:	AGAIR Logistics		
Serial number:	96051		
Type of operation:	Part 138 Aerial work operations - task specialist		
Activity:	General aviation / Aerial work / Photography		
Departure:	Toowoomba Airport, Queensland		
Intended destination:	Mount Isa Airport, Queensland		
Persons on board:	Crew – 3	Passengers – 0	
Injuries:	Crew – 3 (fatal)	Passengers – 0	
Aircraft damage:	Destroyed		

# Australian Transport Safety Bureau

### About the ATSB

The ATSB is an independent Commonwealth Government statutory agency. It is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers.

The ATSB's purpose is to improve the safety of, and public confidence in, aviation, rail and marine transport through:

- 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, as well as participating in overseas investigations involving Australian-registered aircraft and ships. It prioritises investigations that have the potential to deliver the greatest public benefit through improvements to transport safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, international agreements.

#### Purpose of safety investigations

The objective of a safety investigation is to enhance transport safety. This is done through:

- identifying safety issues and facilitating safety action to address those issues
- providing information about occurrences and their associated safety factors to facilitate learning within the transport industry.

It is not a function of the ATSB to apportion blame or provide a means for determining 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. The ATSB does not investigate for the purpose of taking administrative, regulatory or criminal action.

#### Terminology

An explanation of terminology used in ATSB investigation reports is available on the ATSB website. This includes terms such as occurrence, contributing factor, other factor that increased risk, and safety issue.