Aviation Investigation Final Report

Location:	Statesboro, Georgia	**Accident Number:**	ERA22FA083
Date & Time:	December 7, 2021, 21:24 Local	**Registration:**	N5776B
Aircraft:	Cessna 182	**Aircraft Damage:**	Destroyed
Defining Event:	VFR encounter with IMC	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The instrument-rated commercial pilot had conducted a cross-country flight to the airport arriving in the afternoon and, after attending a meeting, was returning to her home airport on a night visual flight rules (VFR) cross-country flight. Before the return flight, the pilot discussed with a family member her knowledge of a low cloud layer and her intention to stay low for the first 10 to 15 miles of the flight. At the time of departure, dark night conditions prevailed, and the airport was reporting an overcast cloud ceiling at 600 ft above ground level (agl).

Review of automatic dependent surveillance-broadcast (ADS-B) data found that the airplane became airborne before the midpoint of the runway and turned right toward the destination airport. It then climbed to about 1,000 ft mean sea level (msl), which was about 800 ft agl, before entering a left turn about 2 miles south of the airport. The airplane continued in a left 360° tightening turn where a maximum altitude of about 1,800 ft msl was reached, which was subsequently followed by a rapid descent. Before the left 360° turn, the airplane likely entered the low cloud layer and never exited the clouds until a few seconds before it impacted with terrain. Multiple witnesses reported that the airplane's engine noise was loud and continuous until impact.

Examination of the wreckage revealed no evidence of preimpact mechanical malfunctions or failures with the airplane. Evaluation of the wreckage indicated that the airplane impacted terrain in a left turning descent at high speed.

Based upon ADS-B, meteorological, and astronomical data, the pilot initiated a VFR flight into known dark night instrument meteorological conditions, which would have prevented reliable control of the airplane using external visual cues. The circling and rapidly ascending and descending flight track was consistent with a pilot who was experiencing spatial

disorientation, which resulted in a loss of control in flight and a high speed impact with terrain. The pilot's instrument and night currency could not be determined.

The pilot's toxicology report was positive for ethanol and quetiapine. Given that the ethanol was identified at a low level in muscle and that none was found in liver tissue, it is likely that the identified ethanol is from sources other than ingestion and unlikely that any effects from it contributed to the circumstances of the crash. Attempts were made to identify the underlying reason for the pilot's use of quetiapine; however, the investigation was unable to do so. While the drug itself may cause neuropsychiatric effects, at the low levels likely present at the time of the event, it was unlikely to impair judgment. However, whether an underlying medical condition might have influenced the pilot's decision-making could not be determined from the available information.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's decision to initiate a visual flight rules flight into dark night instrument meteorological conditions, which resulted in spatial disorientation and subsequent loss of control shortly after takeoff.

Findings

Personnel issues	Decision making/judgment - Pilot
Personnel issues	Spatial disorientation - Pilot
Environmental issues	Low ceiling - Decision related to condition
Environmental issues	Dark - Decision related to condition

Factual Information

History of Flight

Initial climb	VFR encounter with IMC (Defining event)
Initial climb	Loss of visual reference
Initial climb	Loss of control in flight
Initial climb	Collision with terr/obj (non-CFIT)

On December 7, 2021, at 2124 eastern standard time, a Cessna 182 airplane, N5776B, was destroyed when it was involved in an accident near Statesboro, Georgia. The pilot was fatally injured. The airplane was operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to a family member, the pilot had flown the airplane from her home airport, Zephyrhills Municipal Airport (ZPH), Zephyrhills , FL (ZPH)Florida, to the Statesboro-Bulloch County Airport (TBR), Statesboro, Georgia, for a meeting and planned to return that night. The pilot owned a sky diving business that had operated out of TBR and was familiar with the area.

The family member reported that during a telephone conversation that occurred about 2030, the pilot told him that the clouds were low and that she would not be flying under an instrument flight rules (IFR) flight plan. She planned to stay at a low altitude for 10 to 15 miles after takeoff during the return trip to ZPH.

Review of automatic dependent surveillance-broadcast (ADS-B) data found that the airplane departed runway 14 at 2121. Shortly after takeoff, the flight track turned south, climbed to about 1,000 ft msl, which was about 800 ft agl, and then about 1.8 nautical miles south of TBR, the airplane entered a left turn. The airplane continued in a left 360° tightening turn where a maximum altitude of about 1,800 ft msl was reached, which was subsequently followed by a rapid descent.

The final position recorded at 2124:32 was about 0.1-miles from the accident site and showed the airplane headed east at an altitude of 575 ft msl (about 375 ft agl). Figure 1 displays the ADS-B flight track, main wreckage area, and witness locations.

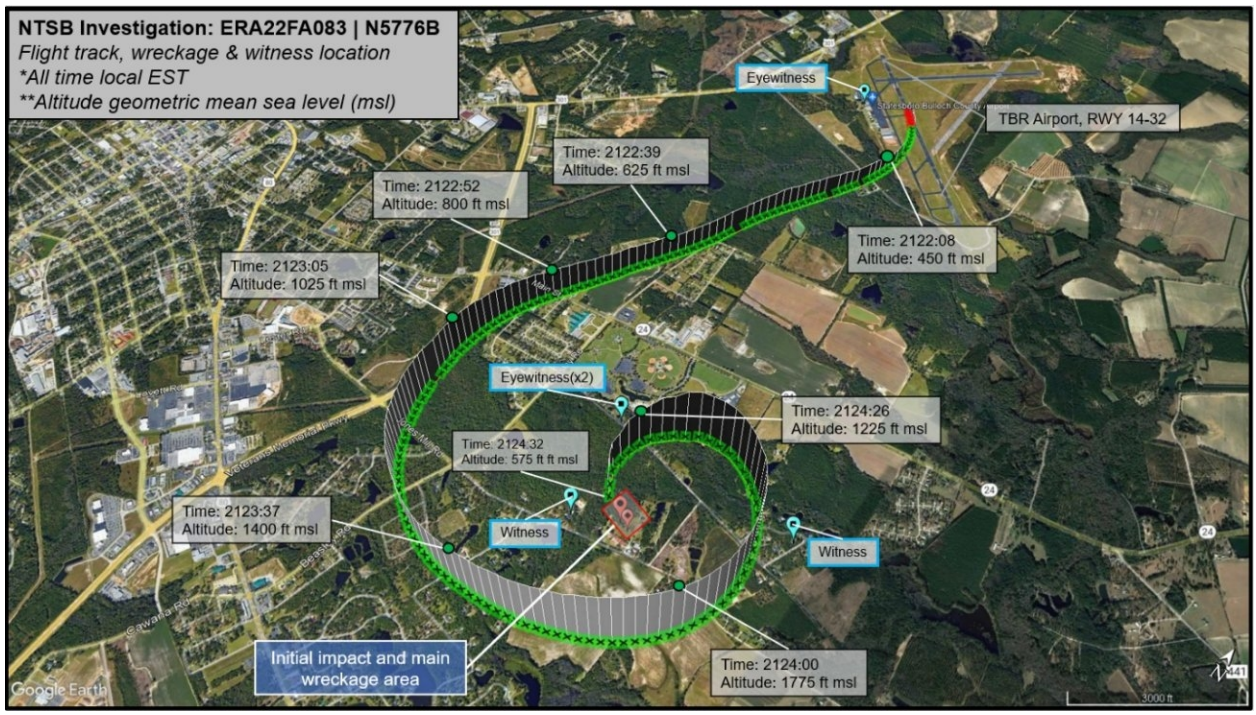

Figure 1: Overview of the flight track, wreckage, and witness locations.

Multiple witnesses reported observing and/or hearing the airplane in-flight. A witness located at the TBR airport parking lot saw the takeoff. The airplane's lights were on; and it sounded as if the airplane was climbing "steeply;" and the engine noise was loud.

Two additional witnesses, who were located together near the accident site, reported seeing the airplane while outside in a driveway. One witness reported that she heard a low flying airplane that sounded like a "crop duster" and "got louder." She then saw the right side of the airplane, and it appeared to be flying in a "curved" descent that continued into a "rapid descent." When the airplane first came into view, she could not recall observing lights or a glow from the airplane; however, as it flew away from her position, she saw a "sparkler glow" before it impacted the ground. The other witness also reported observing the airplane in a descent that continued into a rapid descent into a field just beyond his view. He added that when the airplane flew by, he could see "lights on the bottom" of the airplane. When asked specifically if he recalled seeing the airplane on fire in the air, he stated that it was not on fire.

Two additional witnesses heard the airplane while in their houses. One of these witnesses was a private pilot and reported that due to the proximity of his house to the airport, he was accustomed to hearing airplanes, but this airplane was "unusually low." He added that the sound dissipated, but a few minutes later, he heard the airplane again, and it sounded like "the engine was screaming" as if the "throttle was through the panel." The other witness reported that she heard engine noise until a "thud" was heard.

Pilot Information

Certificate:	Commercial	**Age:**	61,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	December 2, 2020
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 4000 hours (Total, all aircraft), 200 hours (Last 90 days, all aircraft)		

The pilot's logbook was not recovered during the investigation. The pilot's most recent flight review, instrument currency, and night currency could not be determined.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N5776B
Model/Series:	182	**Aircraft Category:**	Airplane
Year of Manufacture:	1956	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	33776
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 15, 2021 Annual	**Certified Max Gross Wt.:**	2800 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	9226 Hrs as of last inspection	**Engine Manufacturer:**	Continental Motors
ELT:	C126 installed, not activated	**Engine Model/Series:**	O-470-50
Registered Owner:	TJP@JAX INC	**Rated Power:**	235 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	TBR,187 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	21:15 Local	**Direction from Accident Site:**	357°
Lowest Cloud Condition:		**Visibility**	7 miles
Lowest Ceiling:	Overcast / 600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.08 inches Hg	**Temperature/Dew Point:**	15°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Statesboro, GA (TBR)	**Type of Flight Plan Filed:**	None
Destination:	Zephyrhills , FL (ZPH)	**Type of Clearance:**	None
Departure Time:	21:21 Local	**Type of Airspace:**	Class G

Review of weather information revealed that instrument meteorological conditions (IMC) in the form of low clouds prevailed at TBR. The IMC conditions were first recorded at 2035, about 45 minutes before the pilot's takeoff. Multiple witnesses confirmed that a low cloud layer persisted throughout the evening.

At 2115, the reported ceiling at TBR was 600 ft agl. Based on this weather observation, the airplane likely entered the low cloud layer about 800 ft msl and did not climb above the top of the cloud layer, which was near 8,000 to 9,000 ft msl.

Dark night conditions prevailed. The end of civil twilight was at 1748, and the moon set was at 2105, about 20 minutes before the accident.

According to Leidos, the Federal Aviation Administration (FAA) contract Flight Service Station provider, and ForeFlight LLC, there was no record that the pilot filed a flight plan or requested a weather briefing via telephone or online. There was also no record of the pilot contacting FAA air traffic control before or during the flight.

Airport Information

Airport:	STATESBORO-BULLOCH COUNTY TBR	**Runway Surface Type:**	Asphalt
Airport Elevation:	186 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	14/32	**IFR Approach:**	None
Runway Length/Width:	6000 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	32.444496,-81.734249

The wreckage was highly fragmented and was oriented on a debris path of about 110° magnetic. The initial impact ground scar was located about 220 ft from the main wreckage final resting location, and the elevation was about 175 ft msl. Figure 2 provides an overview of the major components of the airplane located at the accident site.

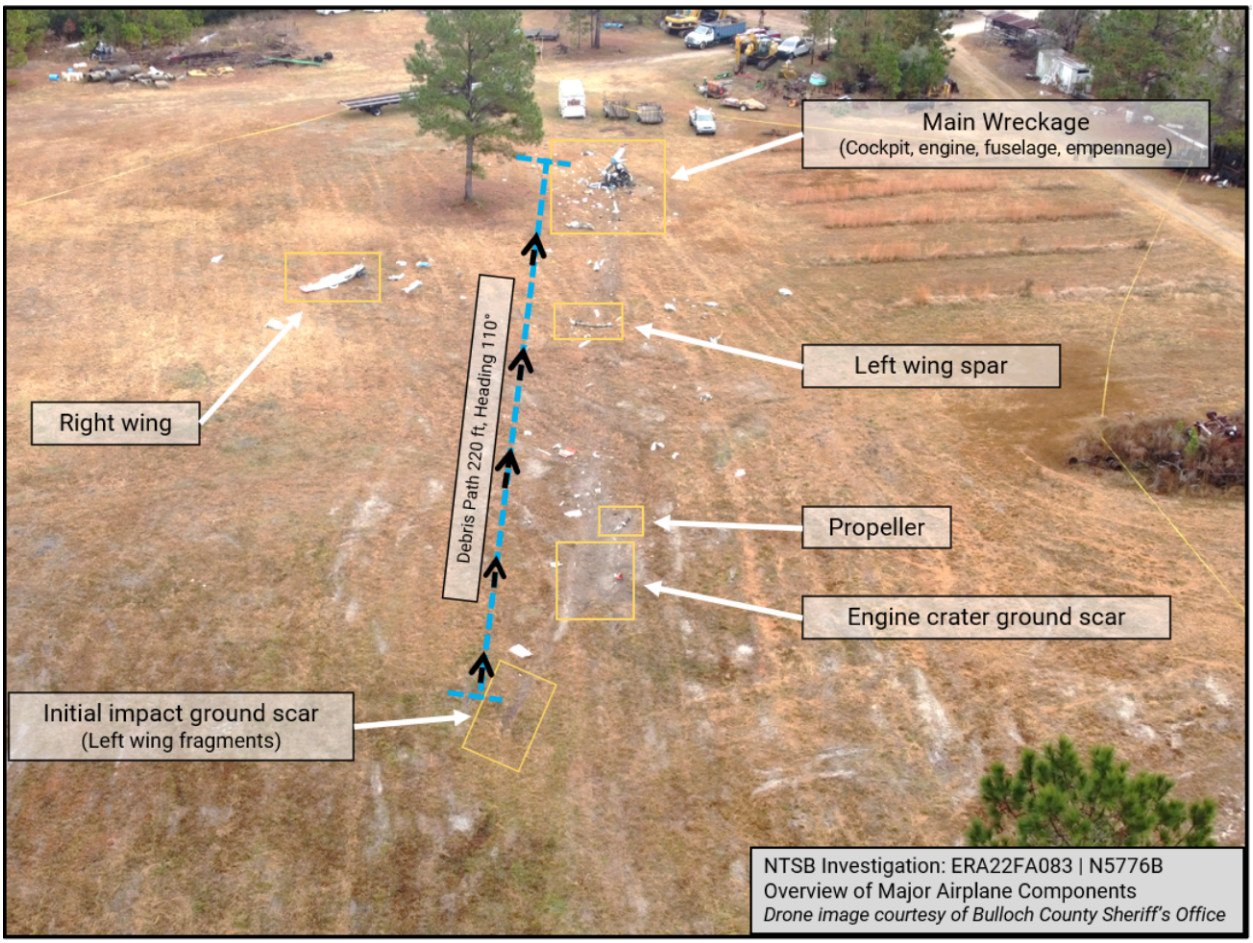

Figure 2: Overview of the major airplane components as located in the debris path.

All major components of the airplane were located in the debris path. The left-wing tip and additional left-wing fragments were located in the initial impact scar, which was consistent with the airplane impacting terrain in a descending left bank. There was no evidence of an in-flight fire; however, the wreckage was thermally damaged during a postcrash fire.

The examination of the wreckage found no evidence of preimpact mechanical malfunctions or failures with the airplane. The altimeter setting corresponded to the correct altimeter setting based on the 2115 TBR weather observation. There was no evidence of a vacuum pump failure.

Medical and Pathological Information

According to the autopsy report issued by the Georgia State Bureau of Investigation, Division of Forensic Sciences, the pilot's cause of death was multiple blunt force injuries, and the manner of death was an accident.

Toxicology testing performed by the FAA's Forensic Sciences Laboratory identified ethanol in muscle tissue at 0.025 gm/dl but none in liver tissue, and testing in brain tissue was inconclusive. In addition, quetiapine was identified in liver tissue at 17 ng/gm. Quetiapine, commonly marketed with the name Seroquel, is an atypical antipsychotic approved for the treatment of schizophrenia and bipolar disease. Off label, in much smaller doses, it may often be used to treat insomnia.

Additional Information

Spatial Disorientation

The FAA Civil Aerospace Institute's publication, "Introduction to Aviation Physiology," defines spatial disorientation as a loss of proper bearings or a state of mental confusion as to position, location, or movement relative to the position of the earth. Factors contributing to spatial disorientation include changes in acceleration, flight in instrument meteorological conditions (IMC), frequent transfer between visual meteorological conditions (VMC) and IMC, and unperceived changes in aircraft attitude.

The FAA's Airplane Flying Handbook (FAA-H-8083-3A) describes some hazards associated with flying when the ground or horizon are obscured. The handbook states, in part: The vestibular sense (motion sensing by the inner ear) in particular tends to confuse the pilot. Because of inertia, the sensory areas of the inner ear cannot detect slight changes in the attitude of the airplane, nor can they accurately sense attitude changes that occur at a uniform rate over a period of time. On the other hand, false sensations are often generated; leading the pilot to believe the attitude of the airplane has changed when in fact, it has not. These false sensations result in the pilot experiencing spatial disorientation.

Preventing Similar Accidents

Reduced Visual References Require Vigilance (SA-020)

The Problem

About two-thirds of general aviation accidents that occur in reduced visibility weather conditions are fatal. The accidents can involve pilot spatial disorientation or controlled flight into terrain. Even in visual weather conditions, flights at night over areas with limited ground lighting (which provides few visual ground references) can be challenging.

What can you do?

- Obtain an official preflight weather briefing, and use all appropriate sources of weather information to make timely in-flight decisions. Other weather sources and in-cockpit weather equipment can supplement official information.
- Refuse to allow external pressures, such as the desire to save time or money or the fear of disappointing passengers, to influence you to attempt or continue a flight in conditions in which you are not comfortable.
- Be honest with yourself about your skill limitations. Plan ahead with cancellation or diversion alternatives. Brief passengers about the alternatives before the flight.
- Seek training to ensure that you are proficient and fully understand the features and limitations of the equipment in your aircraft, particularly how to use all features of the avionics, autopilot systems, and weather information resources.
- Don’t allow a situation to become dangerous before deciding to act. Be honest with air traffic controllers about your situation, and explain it to them if you need help.
- Remember that, when flying at night, even visual weather conditions can be challenging. Remote areas with limited ground lighting provide limited visual references cues for pilots, which can be disorienting or render rising terrain visually imperceptible. When planning a night VFR flight, use topographic references to familiarize yourself with surrounding terrain. Consider following instrument procedures if you are instrument rated or avoiding areas with limited ground lighting (such as remote or mountainous areas) if you are not.
- Manage distractions: Many accidents result when a pilot is distracted momentarily from the primary task of flying.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-020.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA

Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Gerhardt, Adam
Additional Participating Persons:	Rodney Hood; FAA/FSDO; Atlanta, GA Andrew Hall; Textron Aviation; Wichita, KS
Original Publish Date:	June 8, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=104367

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