Aviation Investigation Final Report

Location:	Fostoria, Ohio	**Accident Number:**	CEN22FA131
Date & Time:	February 22, 2022, 22:41 Local	**Registration:**	N3952W
Aircraft:	Piper PA-32-260	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Business		

Analysis

The pilot was conducting a night cross-country flight in instrument meteorological conditions. After passing the initial approach fix (IAF) for the RNAV (GPS) instrument approach at the destination airport, the airplane made about a 30° left turn, consistent with a teardrop entry into the procedure turn. The track data showed the airplane aligned with the outbound side of the holding pattern for about a mile before turning left again. As the airplane flew north of the published hold in its final minute of flight its altitude decreased from about 3,000 ft to about 2,600 ft before climbing back to about 3,000 ft and about 4 nautical miles (nm) from the initial approach fix (IAF), the airplane turned right, and descended rapidly in a spiral. The airplane traveled through heavily forested terrain and was highly fragmented.

A witness who was inside a residence described hearing an airplane at a low altitude near the house. The witness described the noise as a loud or high pitch engine followed by silence. Another nearby witness saw the lights of the airplane but did not hear anything because they were in a car with the radio on. The witness stated the airplane was between 300 and 500 ft above ground level (agl). When they lost sight of the airplane as it descended behind houses, they estimated the altitude between 150 and 250 ft agl.

A postaccident examination of the airframe and engine revealed no preaccident mechanical malfunctions or failures that would have precluded normal operation.

The pilot's toxicology results revealed that sedating antihistamines diphenhydramine and doxylamine were present in tissue samples. It is possible that the combined effects of those drugs might have increased the pilot's susceptibility to spatial disorientation. However, the diphenhydramine and doxylamine results in tissue cannot be used to establish whether the

drugs contributed to spatial disorientation or were otherwise impairing the pilot at the time of the accident.

Based upon the wreckage fragmentation, which was consistent with a high-speed impact, the constant descending turn and IMC, it is likely that the accident pilot experienced spatial disorientation and lost airplane control.

Probable Cause and Findings

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

The pilot's loss of airplane control in night instrument meteorological conditions during the procedure turn of an instrument approach due to spatial disorientation, which resulted in a collision with terrain.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Altitude - Not attained/maintained
Aircraft	Heading/course - Not attained/maintained
Personnel issues	Spatial disorientation - Pilot
Environmental issues	Clouds - Contributed to outcome

Factual Information

History of Flight

Approach-IFR initial approach	Loss of control in flight (Defining event)
Approach-IFR initial approach	Controlled flight into terr/obj (CFIT)
Approach-IFR initial approach	Miscellaneous/other

On February 22, 2022, about 2241 eastern standard time, a Piper PA32 airplane, N3952W, was destroyed when it was involved in an accident near Fostoria, Ohio. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 business flight.

The flight was conducted as an instrument flight rules (IFR) flight from Effingham County Memorial Airport (1H2), Effingham, Illinois to Findlay Airport (FDY), Findlay, Ohio. The filed IFR flight plan stipulated a cruise altitude of 9,000 ft mean sea level (msl), an estimated time en route of 1 hour 28 minutes with 4 hours of fuel on board.

A review of archived Federal Aviation Administration (FAA) automatic dependent surveillance broadcast data revealed that the airplane departed 1H2 about 1956 central standard time, climbed to about 7,000 ft msl and proceeded on a relatively direct track toward DOYET, the initial approach fix for the RNAV/GPS runway 25 instrument approach, as shown in figure 1.

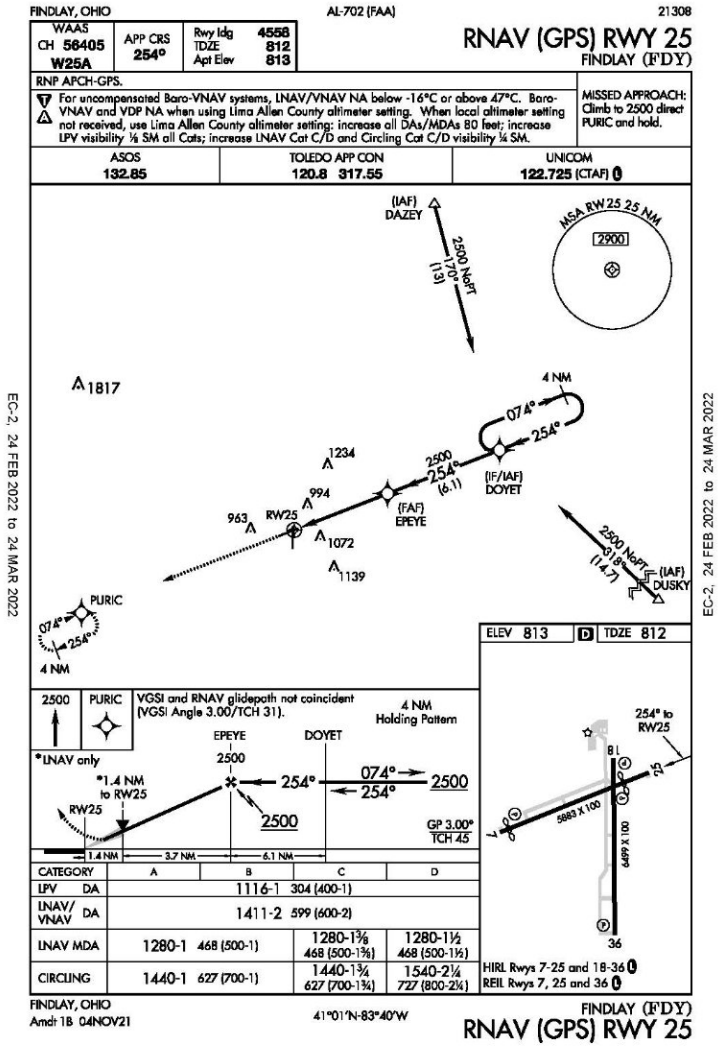

Figure 1: Published Instrument Approach Procedure

After passing DOYET, the airplane made about a 30° left turn, consistent with a teardrop entry into the procedure turn. The airplane aligned with the outbound side of the holding pattern for about a mile before turning left again. As the airplane flew north of the published holding pattern in its final minute of flight its altitude decreased from about 3,000 ft to about 2,600 ft before climbing back to about 3,000 ft About 4 nm from the IAF, the airplane turned right, and descended rapidly in a spiral and impacted terrain on a heading of 340° (see figure 2).

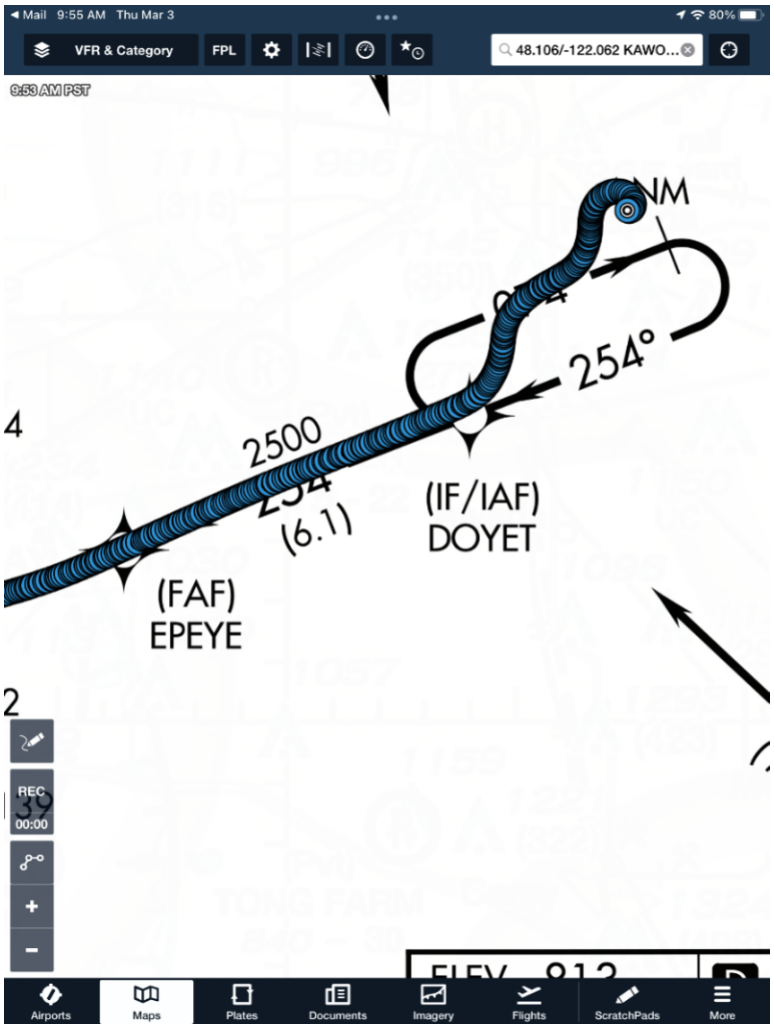

Figure 2: Instrument Approach with Flight Track Overlay

A review of commercially available communications data revealed that the last confirmed communication between the accident airplane and air traffic control (ATC) took place when ATC instructed the pilot to cross DOYET at or above 3,000 ft and cleared them for the RNAV runway 25 approach, to which the pilot read back the clearance and altitude restriction. Shortly thereafter, ATC attempted to contact the pilot and subsequently issued a low altitude alert, but no reply or acknowledgement was received.

A witness inside their residence described hearing an airplane low near their house. They described the noise as a loud engine or high rpm engine followed by silence. Another nearby witness saw the lights of the airplane but did not hear anything because they were in a car with the radio on. They said that at first sight, the airplane was estimated between 300 and 500 ft above ground level (agl). When they lost sight of the airplane as it descended behind houses, they estimated the altitude between 150 and 250 ft agl.

Pilot Information

Certificate:	Commercial	**Age:**	59,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	May 10, 2021
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 1137.2 hours (Total, all aircraft), 630.8 hours (Total, this make and model)		

Pilot Information

Certificate:	Airline transport	**Age:**	51,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	January 10, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 6500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3952W
Model/Series:	PA-32-260	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32-936
Landing Gear Type:	Tricycle	**Seats:**	6
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1
Airframe Total Time:		**Engine Manufacturer:**	
ELT:	C91 installed	**Engine Model/Series:**	
Registered Owner:	On file	**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	KFDY,809 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	22:39 Local	**Direction from Accident Site:**	240°
Lowest Cloud Condition:		**Visibility**	8 miles
Lowest Ceiling:	Broken / 600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	27 knots / 33 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.94 inches Hg	**Temperature/Dew Point:**	5°C / 3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Effingham, IL (1H2)	**Type of Flight Plan Filed:**	IFR
Destination:	Findlay, OH (FDY)	**Type of Clearance:**	IFR
Departure Time:	19:57 Local	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	41.14139,-83.377247

The airplane impacted a field in a relatively flat attitude and continued on a 340° track into a forest, where it collided with multiple trees and became highly fragmented. Flight control continuity could not be established due to the highly fragmented nature of the wreckage, but all lengths of control cables were accounted for at the accident location. All major pieces of the airplane were observed at the accident location.

A postaccident examination of the engine revealed no mechanical malfunctions or anomalies that would have precluded normal operation.

Medical and Pathological Information

The FAA Forensic Sciences laboratory performed toxicological testing of postmortem specimens from the pilot. Diphenhydramine was detected in liver and muscle and Doxylamine was detected in muscle; the liver specimen was unsuitable for reporting a doxylamine result. Dextromethorphan was detected in liver and muscle, and the dextromethorphan metabolite dextrorphan was detected in liver (not in muscle).

Diphenhydramine is a sedating antihistamine medication available over the counter in multiple cold and allergy products and sleep aids. Doxylamine is another sedating antihistamine medication that is available over the counter as a sleep aid and as an ingredient in various cold and allergy products. Sedating antihistamines can cause cognitive and psychomotor slowing and drowsiness, and products containing sedating antihistamines often carry warnings that they may impair performance of tasks like driving and operating heavy machinery. The FAA states that pilots should not fly within 60 hours of using diphenhydramine or doxylamine, to allow time for the drugs to be cleared from circulation.

Dextromethorphan is a cough suppressant medication that is available over the counter in a variety of cold and allergy products. Dextrorphan is the main active metabolite of

dextromethorphan. Dextromethorphan and dextrorphan are not typically impairing at levels associated with medicinal dextromethorphan use. The FAA states that pilots who use dextromethorphan should observe a waiting period for the drug to be cleared from circulation before flying.

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Additional Information

Spatial Disorientation

The Federal Aviation Administration's (FAA) *Airplane Flying Handbook* (FAA-H-8083-3B) described some hazards associated with flying when the ground or horizon are obscured. The handbook states, in part, the following:

> *The vestibular sense (motion sensing by the inner ear) in particular can and will confuse the pilot. Because of inertia, the sensory areas of the inner ear cannot detect slight changes in airplane attitude, 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.*

Administrative Information

Investigator In Charge (IIC):	Williams, David
Additional Participating Persons:	Alexander McAninch; FAA; Cleveland, OH Jon Hirsch; Piper Aircraft; Vero Beach, FL David Harsanyi; Lycoming Engines; Williamsport, PA
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Note:	
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