Aviation Investigation Final Report

Location:	Bloomington, Indiana	**Accident Number:**	CEN22FA080
Date & Time:	December 17, 2021, 20:08 Local	**Registration:**	N5677V
Aircraft:	Piper PA-32R-300	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

After departure, the flight proceeded on course and was issued radar vectors for an instrument landing system (ILS) approach at the intended destination airport. The flight tracked inbound along the ILS localizer; however, after it passed the final approach fix the airplane's flight path appeared to become unstable. The airplane subsequently entered a right turn about 2.25 miles from the runway and impacted a wooded hillside absent of ground lighting about 2 miles south of the airport. The impact path was oriented nearly perpendicular to the runway extended centerline. Postaccident airframe and engine examinations did not reveal any anomalies consistent with a preimpact malfunction or failure.

Airplane airspeed varied from about 90 knots to 155 knots as the flight neared and then intercepted the ILS approach course. Airplane vertical speed during this timeframe ranged from a 1,500 feet-per-minute (fpm) climb to a 1,000-fpm descent. The airplane's airspeed was about 128 knots as it crossed the final approach fix and during the final 60 seconds of the flight was about 118 knots. The airplane remained in a descent that exceeded 1,000 fpm over the final 30 seconds of the flight.

A review of available weather data indicated the pilot was likely in instrument meteorological conditions and precipitation and likely encountered turbulence with moderate or greater low-level wind shear during the approach.

The Pilot's Operating Handbook recommended an indicated airspeed of 75 knots on final approach. When established on a 3° glideslope with a 90-knot groundspeed, an airplane will descend at 450 fpm. The FAA defined a stabilized approach as one that maintains a constant angle glidepath toward a predetermined point on the landing runway.

It is likely that an inadvertent encounter with turbulence and low-level wind shear resulted in an unstable approach and subsequent loss of control. The presence of instrument meteorological conditions and dark night lighting conditions when the airplane did emerge from the clouds further hindered the pilot's efforts to remain on the approach or to execute a missed approach.

Probable Cause and Findings

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

The pilot's failure to follow the instrument landing system (ILS) course guidance, which resulted in the pilot's loss of airplane control during the instrument approach. Contributing to the accident was the presence of turbulence and low-level wind shear.

Findings

Aircraft	Descent/approach/glide path - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	(general) - Effect on operation
Environmental issues	Windshear - Effect on operation

Factual Information

History of Flight

Approach-IFR final approach	Loss of control in flight (Defining event)
Approach-IFR final approach	Collision with terr/obj (non-CFIT)

On December 17, 2021, at 2008 eastern standard time, a Piper PA-32R-300 airplane, N5677V, was destroyed when it was involved in an accident near the Monroe County Airport (BMG), Bloomington, Indiana. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Automatic dependent surveillance – broadcast (ADS-B) and Federal Aviation Administration (FAA) air traffic data revealed that the pilot initially departed Chicago Executive Airport (PWK) at 1618 central standard time en route to Indianapolis Metro Airport (UMP), arriving at 1844 eastern standard time. He subsequently departed UMP at 1925 eastern standard time with an intended destination of BMG. After departure from UMP, the airplane proceeded on course to the southwest, then to the south, and climbed to an altitude of about 4,000 ft mean sea level (msl). Upon contacting the BMG approach controller, the pilot was instructed to descend to 3,000 ft msl and issued radar vectors for the instrument landing system approach to runway 35.

About 2003, the controller issued an intercept heading to the pilot and cleared him for the approach. About 2005, the pilot reported that the flight was established on the approach and the controller instructed the pilot to contact the control tower. The tower controller subsequently cleared the pilot to land; however, the pilot never responded. The airplane tracked inbound along the ILS runway 35 localizer. At 2006:58, the airplane passed the final approach fix (NITTE); the airplane's altitude was about 2,258 ft msl at that time. After the airplane passed NITTE, the flight path appeared to become more erratic in comparison to the airplane flight path before passing NITTE. At 2008:15, the airplane entered a right turn approximately 2.25 miles from the runway. The final data point was recorded at 2008:29; the airplane's altitude was about 1,045 ft msl at that time.

Airspeed and climb/descent rates derived from ADS-B position and altitude data indicated the airplane was stabilized about 3,000 ft msl and 120 knots until about 1959. The airspeed then decreased and appeared to stabilize about 110 knots with the airplane remaining about 3,000 ft msl. At 2002:20, a momentary altitude deviation was recorded consisting of a 200 ft loss immediately followed by a 300 ft gain. During this time, the airspeed initially increased and then decreased to as low as 90 knots before recovering. From 2003:00 until 2006:40, the airplane entered a general descent with momentary level offs or climbs. Airspeed during this

timeframe increased to about 150 knots before decreasing again. Beginning at 2006:40, the airplane entered a continuous descent until the final data point. The average airplane descent rate between the final approach fix and the final ADS-B data point varied from about 400 fpm to over 1,200 fpm.

A passenger on the flight from PWK to UMP reported that it was smooth with no issues, and communications with air traffic control seemed routine. They encountered some rime icing near Lafayette, Indiana; the pilot descended out of the icing conditions and the flight proceeded without incident. The pilot seemed to be “very conscientious.” She flew with the pilot from UMP to PWK the preceding day, which was also uneventful.

Pilot Information

Certificate:	Private	**Age:**	40,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	July 13, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	December 2, 2021
Flight Time:	448 hours (Total, all aircraft), 219 hours (Total, this make and model), 30 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N5677V
Model/Series:	PA-32R-300	**Aircraft Category:**	Airplane
Year of Manufacture:	1977	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-7780359
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	August 13, 2021 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	4054 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-540-K1G5D
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None
Operator Does Business As:	On file	**Operator Designator Code:**	N/A

The Pilot's Operating Handbook recommended a final approach indicated airspeed of 75 knots.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	KBMG,846 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	20:11 Local	**Direction from Accident Site:**	338°
Lowest Cloud Condition:		**Visibility**	4 miles
Lowest Ceiling:	Overcast / 500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	Terrain-Induced / Terrain-Induced
Wind Direction:	130°	**Turbulence Severity Forecast/Actual:**	Moderate / Unknown
Altimeter Setting:	30.06 inches Hg	**Temperature/Dew Point:**	4°C / 3°C
Precipitation and Obscuration:	Moderate - None - Mist		
Departure Point:	Indianapolis, IN (UMP)	**Type of Flight Plan Filed:**	IFR
Destination:	Bloomington, IN (BMG)	**Type of Clearance:**	IFR
Departure Time:	19:25 Local	**Type of Airspace:**	Class D

An area of clouds and precipitation was present in the vicinity of the accident site. The precipitation and cloud cover continued to increase over the region with a southwesterly wind above 5,000 ft. These conditions resulted in low instrument flight rules conditions with ceilings at 400 ft above ground level (agl), and the possibility of light to moderate low-level wind shear below 2,000 ft agl. No icing potential was indicated below 10,000 ft.

A wind model indicated a near surface wind from 109° at 9 knots with the wind remaining easterly through 2,000 ft. Above 2,000 ft the wind veered and became southwesterly to westerly through 14,000 ft. The wind speed was between 10 to 20 knots between the surface and about 1,200 ft agl. The wind speed continued to increase with height to 30 knots by 4,000 ft.

Airport Information

Airport:	Monroe County BMG	**Runway Surface Type:**	Asphalt
Airport Elevation:	846 ft msl	**Runway Surface Condition:**	Wet
Runway Used:	35	**IFR Approach:**	ILS
Runway Length/Width:	6500 ft / 150 ft	**VFR Approach/Landing:**	Full stop

The ILS 35 approach at BMG consisted of a 3° glideslope with a final approach crossing altitude of 2,500 ft msl and a decision altitude of 1,044 ft msl. This was 200 ft above the runway touchdown zone elevation of 844 ft. A missed approach required an initial climb to 2,000 ft msl along the extended runway centerline.

The FAA defined a stabilized approach as one that maintains a constant angle glidepath toward a predetermined point on the landing runway. When established on a 3° glideslope, an airplane at 90 knots groundspeed will descend at 450 fpm. At 120 knots, an airplane will descend at 600 fpm to remain on the same glideslope.

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:**	39.108858,-86.604478

The airplane impacted a wooded hillside absent of ground lighting about 2 miles south of the runway on an easterly heading. The initial tree impact was about 112 ft from the final ADS-B data point. Multiple tree breaks were observed along the impact path. One tree strike consistent with a propeller blade cut was located within the debris path.

The fuselage came to rest about 300 ft from the initial tree strike and was partially consumed by a postimpact fire. The propeller hub was fractured consistent with overstress. Both propeller blades were liberated and located at the accident site. The engine was partially separated and located in position forward of the firewall. The wings and empennage were fragmented. All airframe structure, including the flight controls, were located within the debris field.

Postaccident airframe and engine examinations did not reveal any anomalies consistent with a preimpact malfunction or failure. The airframe exam was hindered by the extent of the postimpact fire.

Medical and Pathological Information

An autopsy of the pilot was performed by Terre Haute Regional Hospital, Terre Haute, Indiana, which listed the cause of death as “multiple blunt impact injuries.” Toxicology testing performed at the FAA Forensic Sciences Laboratory found no evidence of carboxyhemoglobin, ethanol, or tested for drugs and medications.

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	Cory Irwin; FAA Flight Standards; Indianapolis, IN Damian Galbraith; Piper Aircraft Co.; Vero Beach, FL J. Mike Childers; Lycoming Engines; Williamsport, PA
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Note:	
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