



Aviation Investigation Final Report

Location:	Raleigh, North Carolina	Accident Number:	ERA20FA014
Date & Time:	October 20, 2019, 19:21 Local	Registration:	N534Z
Aircraft:	Piper PA32	Aircraft Damage:	Destroyed
Defining Event:	Controlled flight into terr/obj (CFIT)	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During a night, instrument flight rules flight in instrument meteorological conditions, the pilot checked in with approach control and was told to expect an instrument approach to a different runway than the one he had planned for. According to air traffic control communications, the pilot subsequently reported some issues interacting with his airplane's GPS and autopilot. He had difficulty reading back instructions, missed radio calls, and did not maintain assigned altitudes and headings. The air traffic controller eventually provided him with radar vectors onto the final approach course, and when the airplane was about 9 miles away from the airport the pilot reported that he had broken out of the clouds and could see lights below. The controller cleared the pilot for a visual approach, but the pilot had difficulty visually acquiring the runway lights, and the controller increased their intensity. The controller subsequently issued two low altitude alerts to the pilot while on final approach. The pilot's last radio transmission indicated he had the runway in sight, but radio and radar contact were lost when the airplane was on short final approach.

The wreckage was found the next morning in a densely wooded and sparsely lit state park about just over a mile from the runway threshold with the wreckage facing the runway; the airplane was destroyed. Damage to the treetops indicated a controlled, gradual descent into the trees, indicative of the pilot not maintaining adequate clearance from the ground during final approach. Postaccident examination of the wreckage did not reveal evidence of a mechanical malfunction or anomaly with the airplane that would have precluded normal operation. A review of the pilot's logbook revealed a lack of recent night and instrument experience; he had not logged the required night and instrument procedures to act as pilot-in-command for a flight carrying passengers at night and in IMC. The pilot's issues with using his airplane's GPS and autopilot during the accident flight were likely due to a lack of recent use in actual or simulated instrument conditions.

Probable Cause and Findings

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

The pilot's failure to maintain a safe glidepath during final approach to the runway, which resulted in a collision with trees and terrain. Contributing was the pilot's lack of recent instrument flight experience.

Findings

Aircraft	Descent/approach/glide path - Not attained/maintained
Personnel issues	Identification/recognition - Pilot
Personnel issues	Recent instrument experience - Pilot

Factual Information

History of Flight

Approach-IFR final approach	Controlled flight into terr/obj (CFIT) (Defining event)
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On October 20, 2019, about 1921 eastern daylight time, a Piper PA-32-301, N534Z, was destroyed when it was involved in an accident near Raleigh, North Carolina. The private pilot and one passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 91 personal flight.

The flight was destined for Raleigh-Durham International Airport (RDU), Morrisville, North Carolina. Air traffic control data provided by the Federal Aviation Administration (FAA) revealed that, at 1825, the pilot checked in with RDU north departure radar (NDR) at 5,000 ft msl and requested the area navigation (RNAV) GPS runway 5R approach to RDU. He was told to expect the RNAV GPS runway 32 approach instead. The pilot reported that he was already set up for the runway 5R approach; however, he would comply and set up for the runway 32 approach.

At 1839, NDR cleared the pilot for the RNAV GPS runway 32 approach. At 1850, NDR advised the pilot to contact RDU tower, local control east (LCE). The pilot then checked in with the LCE controller and advised that he was "...on the 32 approach." The LCE controller cleared the flight to land. At 1852, the pilot advised LCE that he needed to climb because his GPS approach just shut off. LCE instructed the pilot to maintain 3,000 ft msl and confirm his heading, and the pilot complied. The LCE controller asked the pilot twice if he was in IMC, and the pilot responded affirmatively the second time and said he was trying to climb over it. At 1854, the LCE controller advised the pilot to contact RDU approach and fly a heading of 140°. The pilot responded that he was having trouble with his heading. The controller asked the pilot to confirm his heading twice, and the pilot responded the second time that his heading was 101°, which the controller confirmed that the flight was heading 100°. The pilot then requested a climb to get above IMC and the controller cleared him to 4,000 ft msl.

At 1856, the pilot reported to NDR that his "autopilot shut off." NDR asked the pilot if he was proceeding directly to the initial approach fix NOSIC; the pilot replied, "let me figure out what's going on here." NDR then advised the pilot to fly heading 050° to get settled and he would provide radar vectors back to the airport. The pilot acknowledged. At 1857, the NDR controller advised the pilot that he was 400 ft above his cleared altitude; the pilot acknowledged. At 1859, NDR advised the pilot that he appeared to be flying northbound and was 500 ft high. At 1901, NDR advised the pilot to expect the initial approach fix (SINNO) for the full approach. The pilot responded that he needed to enter the input and asked the controller for the phonetics for SINNO, then 3 minutes later the NDR controller told the pilot that he missed SINNO and advised the pilot to fly a 230° heading to fly straight over NOSIC; the pilot acknowledged.

At 1911, NDR asked the pilot if he had NOSIC in yet, and the pilot responded that he was heading directly to NOSIC. The NDR controller then cleared the pilot to fly directly to NOSIC and fly the

straight in approach to runway 32. The pilot did not acknowledge. About 1 minute later, NDR cleared the pilot for the RNAV GPS runway 32 approach; the pilot acknowledged. At 1917, the NDR controller advised the pilot that he was off to the right of the approach; the pilot responded that he was turning back to it, then he “just broke out” of the clouds.

The NDR controller asked the pilot if he had the runway in sight then cleared the pilot twice for a visual approach to runway 32; the pilot responded only after the third communication that he had trouble identifying the runway lights. The NDR controller then advised the pilot of a low altitude alert and to maintain 2,000 ft msl. The NDR controller then advised the pilot that the runway was 12 o’clock and 9 miles and asked if the pilot had the runway in sight; the pilot reported that he believed he saw the airport beacon. The NDR controller then advised twice that, if the pilot had the runway in sight, he was cleared for the visual approach.

At 1919, the controller increased the runway lights’ intensity, and the pilot reported that he thought he saw them. At 1920, NDR advised the pilot to contact the RDU tower, and the pilot acknowledged. Then the tower controller affirmed to the NDR controller that he had the airplane in sight. The LCE controller then advised the pilot of another low altitude alert, and the pilot verified that he had the runway in sight.

No further communications were received from the pilot and radar contact was lost. After numerous calls to the pilot went unanswered, airport rescue and firefighting personnel were notified, and a search was initiated for the airplane. The wreckage was located about 1000 on October 21 (the next morning).

A witness landed his airplane on runway 32 shortly before the accident. He reported turning off runway 32 and watching for the accident airplane through his rear window because he was worried about the pilot. He heard some of the radio communications and thought that the pilot sounded confused and was having difficulty with the approach. He saw the airplane break out under the clouds, and the airplane’s landing light was off. He reported that the airplane was stable on the approach and just descended into the tree line. He also reported that, on the approach to runway 32, the state park area below the approach was dark with no lights.

Pilot Information

Certificate:	Private	Age:	72, 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 With waivers/limitations	Last FAA Medical Exam:	December 13, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	(Estimated) 2956 hours (Total, all aircraft), 10 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

According to the pilot's logbook entries, he did not meet the recent instrument flight experience and night takeoff and landing requirements of Title 14 *CFR* part 61.57 to act as pilot-in-command of an aircraft carrying passengers. His most recent instrument experience was on November 26, 2018, when he logged three instrument approaches. His most recent night experience was logged on November 3, 2018, when he recorded 0.5 hour of flight.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N534Z
Model/Series:	PA32 301	Aircraft Category:	Airplane
Year of Manufacture:	1989	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	3206054
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	December 14, 2018 Annual	Certified Max Gross Wt.:	3600 lbs
Time Since Last Inspection:	48 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	2172 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	C91 installed, not activated	Engine Model/Series:	IO-540-K1G5
Registered Owner:	On file	Rated Power:	300 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night/dark
Observation Facility, Elevation:	KRDU,435 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	18:51 Local	Direction from Accident Site:	320°
Lowest Cloud Condition:		Visibility	10 miles
Lowest Ceiling:	Broken / 1000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:		Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	29.86 inches Hg	Temperature/Dew Point:	16°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Columbus, GA (CSG)	Type of Flight Plan Filed:	IFR
Destination:	Raleigh, NC (RDU)	Type of Clearance:	IFR
Departure Time:	16:05 Local	Type of Airspace:	Class C

The 1851 local weather observation (about 30 minutes before the accident) for RDU included a ceiling of 1,000 ft above ground level broken and 10 statute miles visibility. The 1956 local weather observation (about 35 minutes after the accident) for RDU included a ceiling of 1,400 ft above ground level overcast and 10 statute miles visibility. Sunset occurred at 1831, and evening civil twilight ended at 1857.

Airport Information

Airport:	Raleigh-Durham Int RDU	Runway Surface Type:	Asphalt
Airport Elevation:	435 ft msl	Runway Surface Condition:	Dry
Runway Used:	32	IFR Approach:	Visual
Runway Length/Width:	3570 ft / 100 ft	VFR Approach/Landing:	Full stop

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:	35.854167,-78.757667(est)

The airplane crashed in a thickly wooded area in William B. Umstead State Park. The wreckage path was about 400 ft long and about 50 ft wide, oriented on a heading of 315°. The main wreckage was located about 1.18 miles southeast of the runway 32 threshold. All aircraft components and structures were accounted for and examined at the accident site.

The initial point of impact was the top of a 100-ft-tall pine tree, and a large section of the right wing remained lodged near the top of the tree. Numerous tree branches were found along the wreckage path with smooth, angular cuts and dark paint transfer marks, consistent with a descent into the trees at a shallow descent angle.

Flight control continuity was confirmed from the cockpit area to all flight control surfaces. Flap torque tube positions as found in the wreckage were consistent with the flaps-up position at impact.

The engine was separated from the fuselage and its engine mount assembly was fragmented. The engine exhibited impact damage. The engine-driven fuel pump was fractured from the engine and fuel was observed within the pump during examination. The engine-driven vacuum pump's drive coupler was intact, and during hand rotation of the drive coupler, the pump was determined to be functional.

The three-blade propeller was fractured from the engine at its attaching point. The propeller spinner remained attached to its bulkheads and exhibited impact damage and torsional deformation. The propeller blades exhibited twisting and s-curved signatures, as well as chordwise scratches.

The fuel selector control and valve were positioned to the "right main tank" position. Fuel was observed within the fuel filter bowl, and the screen was free of debris. Examination of the fuel selector valve revealed the selector was in its detent, and its port was open for the selected tank position.

Examination of a vacuum-driven attitude indicator gyro and its internal gyro rotor and housing revealed no rotational scoring.

The landing light switch in the cockpit was found in the on position; however, the panel was damaged from impact. The landing light assembly was destroyed by impact forces.

Medical and Pathological Information

According to the Office of the Chief Medical Examiner, Raleigh, North Carolina, autopsy report, the cause of death of the pilot was multiple blunt force injuries and the manner of death was accident.

Toxicology testing performed by the FAA's Forensic Sciences Laboratory detected salicylate (aspirin) in the urine. Testing for ethanol and tested-for common drugs of abuse was negative. Testing for carboxyhemoglobin (to determine potential carbon monoxide poisoning) was not performed due to a lack of suitable specimens.

Administrative Information

Investigator In Charge (IIC):	Hicks, Ralph
Additional Participating Persons:	Ronald Gatewood; FAA/FSDO; Greensboro, NC Damian Galbraith; Piper Aircraft; Vero Beach, FL
Original Publish Date:	February 16, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=100457

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).