



# National Transportation Safety Board Aviation Accident Final Report

---

<b>Location:</b>	New Gretna, NJ	<b>Accident Number:</b>	ERA17FA052
<b>Date &amp; Time:</b>	11/19/2016, 1902 EST	<b>Registration:</b>	N4976K
<b>Aircraft:</b>	RYAN NAVION	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Windshear or thunderstorm	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

---

## Analysis

The private pilot was conducting a personal cross-country flight. The pilot's friend reported that he provided weather information to the pilot about 1 hour before the flight; no record was found indicating that the pilot or the friend obtained a formal weather briefing before he departed for the night cross-country flight. A review of weather information revealed that, about 1 hour 20 minutes into the flight, as the airplane was nearing the destination airport, it encountered a strong cold front boundary with associated severe wind shear and turbulence. Review of radar data revealed that, during the following 13 minutes, the flight completed numerous course deviations, including three complete left circuits and two right circuits, before impacting wooded terrain. Review of the last 3 minutes of radar data revealed that the airplane's altitude oscillated between 2,100 and 200 ft mean sea level (msl) as it completed the two right circuits and one of the left circuits before it impacted terrain. The last target was recorded about 2,000 ft southeast of the accident site at an altitude of 525 ft msl. Examination of the wreckage did not reveal any preimpact mechanical malfunctions or failures that would have precluded normal operation. Based on the evidence, it is likely that the airplane encountered wind shear and turbulent conditions upon encountering the strong cold front boundary and that the pilot subsequently 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 inadequate preflight weather planning and in-flight weather evaluation, which resulted in an encounter with a strong cold front and the pilot's subsequent loss of airplane control.

## Findings

<b>Aircraft</b>	Performance/control parameters - Not attained/maintained (Cause)
<b>Personnel issues</b>	Weather planning - Pilot (Cause) Identification/recognition - Pilot (Cause) Aircraft control - Pilot (Cause)
<b>Environmental issues</b>	Convective weather - Effect on operation (Cause)

## Factual Information

### History of Flight

Enroute-cruise	Windshear or thunderstorm (Defining event) Loss of control in flight
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On November 19, 2016, about 1902 eastern standard time, a Ryan Navion A, N4976K, impacted wooded terrain while maneuvering near New Gretna, New Jersey. The private pilot was fatally injured, and the airplane was substantially damaged. The airplane was registered to and operated by the private pilot as a 14 *Code of Federal Regulations* Part 91 personal flight. Night visual meteorological conditions prevailed, and no flight plan was filed. The flight originated from Hummel Field (W75), Saluda, Virginia, about 1730, destined for Ocean County Airport (MJX), Toms River, New Jersey.

The day before the accident, the pilot flew uneventfully from MJX to Accomack County Airport (MFV), Melfa, Virginia for an overnight visit with a friend who was also a pilot. On the day of the accident, both pilots flew their airplanes to W75 for dinner. After dinner, they both fueled their airplanes and about 1730, they departed for home (the pilot to MJX and the friend to MFV). While en route, they communicated with each other on their radios. During approach to MFV, about 1805, the friend experienced wind shear and performed a missed approach. He advised the pilot of the strong wind conditions, which he acknowledged. The friend radioed the pilot again about 1830 to check on him, and he replied that he was okay and had reached the Delaware Bay. No further communications were received from the pilot.

Review of weather information and radar data provided by the Federal Aviation Administration (FAA) revealed that, after departure, the accident flight proceeded on a relatively direct course until about 1849, when it encountered the leading edge of a cold front boundary. During the following 13 minutes, the flight completed numerous course deviations, including three complete left circuits and two right circuits, before impacting wooded terrain. Review of the last 3 minutes of radar data revealed that the airplane's altitude oscillated between 2,100 and 200 ft mean sea level (msl) as it completed the two right circuits and one of the left circuits before impacting terrain. The last target was recorded at 1902:36, when the airplane was about 2,000 ft southeast of the accident site at an altitude of 525 ft msl.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	75, Male
<b>Airplane Rating(s):</b>	Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Lap Only
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 With Waivers/Limitations	<b>Last FAA Medical Exam:</b>	05/07/2015
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	800 hours (Total, all aircraft), 999999 hours (Total, this make and model)		

The pilot held a private pilot certificate with an airplane single-engine land rating. He did not have an instrument rating. His most recent FAA third-class medical certificate was issued on May 7, 2015. At that time, he reported a total flight experience of 800 hours. The pilot's logbook was not recovered.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	RYAN	<b>Registration:</b>	N4976K
<b>Model/Series:</b>	NAVION A	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1949	<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	NAV-4-1976
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	07/12/2016, Annual	<b>Certified Max Gross Wt.:</b>	2850 lbs
<b>Time Since Last Inspection:</b>	23 Hours	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	3501.1 Hours as of last inspection	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	C91A installed, not activated	<b>Engine Model/Series:</b>	E-185
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	205 hp
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

The four-seat, low-wing, retractable tricycle-gear airplane was manufactured in 1949. It was powered by a 205-horsepower Continental E-185 engine and was equipped with a constant-speed Hartzell propeller. The pilot purchased the airplane in 1993. Review of maintenance records revealed that the airplane's most recent annual inspection was completed on July 12, 2016. At that time, the airframe had accumulated about 3,501 total flight hours, and the engine

had accumulated about 548 hours since major overhaul. According to the tachometer, the airplane had flown about 23 hours from the time of the annual inspection until the accident.

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night
Observation Facility, Elevation:	MJX, 86 ft msl	Distance from Accident Site:	16 Nautical Miles
Observation Time:	1856 EST	Direction from Accident Site:	25°
Lowest Cloud Condition:	Clear	Visibility	3 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	150°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	29.64 inches Hg	Temperature/Dew Point:	12° C / 12° C
Precipitation and Obscuration:	Mist; No Precipitation		
Departure Point:	SALUDA, VA (W75)	Type of Flight Plan Filed:	None
Destination:	TOMS RIVER, NJ (MJX)	Type of Clearance:	None
Departure Time:	1730 EST	Type of Airspace:	

The pilot's friend reported that he had obtained a weather briefing about 1630 via flight service for both his and the pilot's flights. The friend added that he told the pilot that the weather was forecast to deteriorate near his destination airport between 1900 and 1930; however, a search of flight service records did not reveal any contact from either pilot's airplane registration numbers on the day of the accident. Additionally, the friend reported that he plotted a route on the pilot's iPad using a Garmin Pilot app, which overlaid weather information; however, a search of ForeFlight and Garmin did not reveal any current subscriptions for the pilot.

MJX was located about 16 miles northeast of the accident site. At 1856, the recorded weather at MJX was wind from 150° at 5 knots, visibility 3 statute miles in mist, sky clear, temperature 12°C, dew point 12°C, and altimeter setting 29.64 inches of mercury.

Atlantic City International Airport (ACY), Atlantic City, New Jersey, located about 14 miles southwest of the accident site. At 1730, the recorded wind at ACY was from 290° at 24 knots, gusting to 31 knots.

Further review of weather data revealed multiple area forecasts for a strong cold front moving through the area with associated severe wind shear and turbulence (for more information, see the Weather Study in the public docket for this accident).

## Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	39.664722, -74.468056 (est)

A debris path, beginning with freshly cut tree branches and a section of right stabilizer tip and right elevator, extended about 420 ft on a magnetic heading north of the main wreckage. The right and left flaps, left wing tip, left aileron, and cabin roof were located about 340 ft along the debris path. The right aileron and left stabilizer tip were located about 390 ft along the debris path.

The main wreckage was inverted at the end of the debris path with both wings separated. The right main landing gear and nose landing gear remained attached to the airframe and were observed in the extended position. The left main landing gear had separated, and the landing gear tire was located next to the main wreckage. The empennage and rudder remained attached to the airframe.

The wreckage was transported to a recovery facility for further examination. Aileron control continuity was confirmed from the cockpit area to the wing roots, where the left and right aileron cable ends exhibited broomstraw separation, consistent with overload. Continuity was also confirmed from the cockpit area to the empennage area, where the elevator and elevator trim cables exhibited broomstraw separation, consistent with overload. The rudder cables exhibited cuts consistent with recovery of the wreckage.

The propeller remained attached to the engine. Both propeller blades exhibited S-bending, chordwise scratching, leading edge gouging, and tip curling. Due to an impact fracture at the front of the engine crankcase, the propeller could only be rotated about 90°. Using a lighted borescope during rotation, crankshaft continuity was confirmed to the pistons, and camshaft continuity was confirmed to the cylinder valves. Both magnetos sparked at all leads when rotated by hand. Throttle control continuity was confirmed to the throttle lever at the carburetor. Mixture control continuity was confirmed to the mixture lever at the carburetor, where the mixture lever was impact separated.

## Medical And Pathological Information

The Burlington County Medical Examiner, Mount Holly, New Jersey, conducted an autopsy on the pilot. The autopsy report noted the cause of death as "multiple injuries."

The FAA's Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma, conducted toxicological testing on specimens from the pilot. The results were negative for alcohol and drugs.

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Robert J Gretz	<b>Report Date:</b>	05/16/2017
<b>Additional Participating Persons:</b>	Paul Basilotto; FAA/FSDO; Philadelphia, PA Nicole Channon; Continental Motors; Mobile, AL		
<b>Publish Date:</b>	05/16/2017		
<b>Note:</b>	The NTSB traveled to the scene of this accident.		
<b>Investigation Docket:</b>	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=94403">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=94403</a>		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).