



Aviation Investigation Final Report

Location:	Greenville, Florida	Accident Number:	ERA16FA074
Date & Time:	December 17, 2015, 19:44 Local	Registration:	N77BP
Aircraft:	HINTON PAUL M RV 4	Aircraft Damage:	Destroyed
Defining Event:	VFR encounter with IMC	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airline transport pilot, who was a US Navy flight instructor and newly certificated civilian flight instructor, was flying his cousin to his home base where he planned to provide her with initial flight training. He received a weather briefing earlier in the day, and the briefer indicated that visual flight rules (VFR) flight was not recommended due to instrument meteorological conditions (IMC) at the surface. Despite the briefer's statement, the pilot indicated he planned on remaining VFR throughout the flight.

Before taking off for the accident flight, during ground operations, the pilot discussed the weather with a former flight service station pilot weather briefer, who told the pilot that the weather was "really bad" in the direction of the pilot's destination, and the pilot agreed, yet he chose to depart anyway. He reported that the pilot appeared to be "in a hurry." No evidence was found indicating that the pilot received any additional weather briefing information before taking off for the accident flight.

The flight departed to the northwest toward an approaching cold front. The conditions associated with the front included low clouds and mist. As the pilot proceeded toward his destination, the flight encountered the front, and the pilot declared an emergency with air traffic control (ATC), stating that he was in instrument flight rules (IFR) conditions and that his airplane was "not capable of IFR." Radar data of the final segment of the flight showed the airplane in a left, 180-degree turn for 43 seconds, immediately followed by a right, 90-degree turn for 37 seconds before radar and radio contact was lost. The last radar return was observed at an altitude of about 1,200 ft mean sea level.

The wreckage was located about 0.2 nautical mile southeast of the last radar return. Forward-to-aft crushing signatures to the wreckage, damage to adjacent trees, and the lack of a linear wreckage debris path were consistent with a near-vertical, nose-low attitude at impact. An examination of the airframe and engine did not reveal any evidence of a preimpact anomaly or malfunction, and the pilot did not report any mechanical issues to ATC. According to the airplane builder and Federal Aviation Administration records, the airplane was not approved for flight in IMC.

The low visibility conditions that existed during the flight, which was conducted at night in instrument conditions, were conducive to the development of spatial disorientation. Further, the pilot's actions and responses and the airplane's turning ground track and near-vertical descent were consistent with the pilot losing airplane control due to spatial disorientation. The pilot should not have initiated the flight into a known approaching cold front in an airplane not equipped for IMC flight, and this decision directly led to the accident.

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 the flight into known adverse weather conditions, in an airplane that was not approved for instrument flight, which resulted in an encounter with instrument meteorological conditions and his subsequent spatial disorientation and loss of airplane control.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Dark - Contributed to outcome
Environmental issues	Clouds - Contributed to outcome
Personnel issues	Spatial disorientation - Pilot
Aircraft	Instrument flight capability - Incorrect use/operation

Factual Information

History of Flight

Enroute-cruise	VFR encounter with IMC (Defining event)
Enroute-cruise	Loss of visual reference
Enroute-cruise	Loss of control in flight
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On December 17, 2015, about 1944 eastern standard time, an experimental, amateur-built RV-4, N77BP, collided with terrain following an in-flight loss of control near Greenville, Florida. The airline transport-rated pilot and student pilot/passenger were fatally injured. The airplane was destroyed by impact forces. The airplane was registered to the pilot and was being operated as a 14 Code of Federal Regulations (CFR) Part 91 personal flight. Night, instrument meteorological conditions were reported along the flight route at the time of the accident, and no flight plan was filed. The flight originated from Apopka, Florida (X04), about 1800 and was destined for Tallahassee International Airport (TLH), Florida.

According to the pilot's father, the purpose of the flight was to fly from Meridian, Mississippi, where the pilot was based in the US Navy, to X04. The pilot would then pick up his cousin and fly her back to Meridian, where he planned to provide her initial flight training in the airplane during her holiday break from college. The flight departed Meridian, and fueling records indicated that the pilot landed at TLH and purchased fuel before continuing to X04.

A former Federal Aviation Administration (FAA) inspector and accident investigator, who had also been a flight service station pilot weather briefer, was at X04 when the pilot arrived on the ramp to pick up his cousin. He reported that, as the airplane was being refueled, he told the pilot that the weather was "really bad" along a line just west of TLH and extending to the northeast, and the pilot agreed. He added that the pilot appeared to be "in a hurry."

The accident flight departed X04 about 1800. According to information obtained from air traffic control transcripts, after takeoff, the airplane reached about 2,500 ft mean sea level (msl) and was approaching the Tallahassee area from the southeast. The Jacksonville Air Route Traffic Control Center (JZX) was providing visual flight rules (VFR) flight following services to the pilot. At 1908, the JZX controller informed the pilot that there was moderate precipitation in the area, and the pilot informed the controller that he would deviate "a little to the north." About 45 seconds later, the pilot informed JZX that he would be diverting to Thomasville (Georgia) Regional Airport for "better weather."

A review of recorded radar data indicated that the airplane continued on a northwesterly track until 1922, when the airplane turned to a westerly direction. A gap in radar coverage was observed until 1940, when the airplane was observed on a southeasterly track. At 1942:49, following a handoff to TLH approach control, the pilot declared an emergency. At 1943:15, the pilot advised the controller that he was in instrument flight rules (IFR) conditions at 1,500 ft and "...I gotta be honest sir my airplane is not

capable of IFR." At 1943:28, the pilot made his last recorded transmission, affirming that he was in IFR conditions. Radar and radio contact was subsequently lost. The final segment of recorded radar data indicated that the airplane was in a left, 180-degree turn for 43 seconds, immediately followed by a right, 90-degree turn for 37 seconds. The last radar return was observed at 1943:39, at an altitude of about 1,200 ft msl.

A search for the airplane was initiated immediately following the loss of radio and radar contact. There were no known witnesses to the accident. The wreckage was located about 0900 the next morning by local authorities. The accident site was located about 0.2 nautical mile (nm) southeast of the last radar return.

Pilot Information

Certificate:	Airline transport; Flight instructor	Age:	31, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	Toxicology Performed:	Yes
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	March 18, 2010
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	December 10, 2015
Flight Time:	2074 hours (Total, all aircraft), 126 hours (Total, this make and model)		

Student pilot Information

Certificate:	Student	Age:	18, Female
Airplane Rating(s):	None	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Without waivers/limitations	Last FAA Medical Exam:	December 4, 2015
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	0 hours (Total, all aircraft), 0 hours (Total, this make and model)		

The pilot held an FAA airline transport pilot certificate with an airplane multiengine land rating, a commercial pilot certificate with an airplane single-engine land rating, and an instrument airplane rating. He also held an FAA flight instructor certificate with airplane single-engine and instrument airplane ratings, which he had obtained 1 week before the accident.

According to US Navy personnel, the pilot was a current naval aviator and flight instructor and had

logged about 1,856 hours of military flight time. According to a pilot logbook recovered at the scene, he had logged about 218 hours of civilian flight time, including 126 hours in the accident airplane.

The pilot's most recent FAA second-class medical certificate was issued on March 8, 2010, with no limitations. Under 14 CFR Section 61.23 (b)(9): Operations not requiring a medical certificate. "A person is not required to hold a medical certificate....When a military pilot of the U.S. Armed Forces can show evidence of an up-to-date medical examination authorizing pilot flight status issued by the U.S. Armed Forces and (i) The flight does not require higher than a third-class medical certificate; and (ii) The flight conducted is a domestic flight operation within U.S. airspace." A DD Form 2992, Medical Recommendation for Flying or Special Operational Duty, dated August 12, 2015, which cleared the pilot for flight duty, was found with the pilot's civilian logbook in the wreckage.

The student pilot/passenger, who was seated in the aft cockpit seat, obtained an FAA student pilot certificate on December 4, 2015. A pilot logbook was found with her personal belongings and revealed 0 hours of logged flight time.

The pilot's father reported that both pilots were very busy and highly driven. There was limited time for this training experience, "but they made the time anyway."

Aircraft and Owner/Operator Information

Aircraft Make:	HINTON PAUL M	Registration:	N77BP
Model/Series:	RV 4 NO SERIES	Aircraft Category:	Airplane
Year of Manufacture:	1995	Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	3281
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	May 23, 2015 Condition	Certified Max Gross Wt.:	1500 lbs
Time Since Last Inspection:	74 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	1012 Hrs at time of accident	Engine Manufacturer:	LYCOMING
ELT:	C91A installed, not activated	Engine Model/Series:	O-320-D1B
Registered Owner:	On file	Rated Power:	160 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

The low-wing, tailwheel-equipped, tandem-cockpit airplane was manufactured in 1995. The pilot was the registered owner of the airplane, and FAA records indicated that he purchased the airplane from the builder in August 2014.

Investigators recovered the airframe and engine logbooks at the accident site. According to the logbook entries, a condition inspection of the airframe and engine was completed on May 23, 2015, at a total airframe time of 938 hours. The total time on the airframe and engine at the time of the accident was about 1,012 hours. FAA records indicated that the airplane was not approved for flight in instrument

conditions. Investigators contacted the builder after the accident, and he reported that the airplane was approved for "day and night VFR only." The airplane was equipped with a transponder and a single Bendix/King VHF communications radio with standby frequency.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	Condition of Light:	Night/dark
Observation Facility, Elevation:	40J,44 ft msl	Distance from Accident Site:	17 Nautical Miles
Observation Time:	00:15 Local	Direction from Accident Site:	180°
Lowest Cloud Condition:		Visibility	10 miles
Lowest Ceiling:	Overcast / 700 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	170°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	29.86 inches Hg	Temperature/Dew Point:	23°C / 22°C
Precipitation and Obscuration:	Light - None - Drizzle		
Departure Point:	Apopka, FL (X04)	Type of Flight Plan Filed:	None
Destination:	TALLAHASSEE, FL (TLH)	Type of Clearance:	None
Departure Time:	18:00 Local	Type of Airspace:	Class G

The pilot received a weather briefing at 1425 from Lockheed Martin Flight Service (LMFS) Flight Watch while the airplane was over South Alabama Regional Airport, Andalusia, Alabama, en route to X04. The pilot also requested updated weather information for the Tallahassee area during the weather briefing. The weather briefer provided the current AIRMETs for turbulence, icing, and IFR conditions, all of which were valid at the airplane's current location in southern Alabama from 1425 to 1431. The weather briefer indicated "VFR flight not recommended with IMC [instrument meteorological conditions] at the surface," then provided the current METAR and the terminal aerodrome forecast for TLH, which forecast an overcast ceiling at 1,500 ft above ground level (agl) and moderate rain showers until 2000. The briefer also provided the pilot the current center weather advisory, which discussed a line of rain and embedded thunderstorms moving from 230° at 40 knots with thunderstorm tops to flight level 350 east of Tallahassee and moving northeastward across northern Florida in between the accident airplane's position at that time and X04. The pilot stated that he intended to remain VFR throughout the flight. The weather briefer said, "VFR flight not recommended," and then provided an alternate destination airport.

The accident flight took off from X04 around 1800. The accident pilot did not contact LMFS or direct user access terminal service to receive a weather briefing on the ground before departing from X04. No evidence was found indicating that the pilot received any additional weather briefing information.

Perry-Foley Airport (K40J), Perry, Florida, located about 17 nm south of the accident site, was the closest official weather station. At 1915, K40J reported wind from 170° at 5 knots, visibility 10 statute miles, light mist, overcast ceiling at 700 ft agl, temperature 23° C, dew point 22° C, and altimeter setting 29.86 inches of mercury (inHg).

At 1935, K40J reported wind from 150° at 5 knots, visibility 10 statute miles, overcast skies at 1,700 ft agl, temperature 23° C, dew point 21° C, and altimeter setting 29.87 inHg.

At 1955, K40J reported wind from 140 degrees at 4 knots, visibility 10 statute miles, broken ceiling at 500 ft agl, broken skies at 1,500 ft agl, overcast skies at 2,100 ft agl, temperature 23° C, dew point 21° C, and altimeter setting 29.87 inHg.

Suwannee County Airport (K24J), Live Oak, Florida, was located 31 nm east-southeast of the accident site. K24J was not equipped with working sky cover instrumentation at the time of the accident. At 1935, K24J reported wind from 180° at 3 knots, visibility 10 statute miles, temperature 22° C, dew point 22° C, and altimeter setting 29.90 inHg. At 1955, K24J reported wind from 180° at 4 knots, visibility 10 statute miles, temperature 22° C, dew point 22° C, and altimeter setting 29.89 inHg.

The National Weather Service surface analysis chart for 1900 depicted a cold front just west of the accident site that stretched from south-southwest into the Gulf of Mexico to north-northeast through central Georgia and into western North Carolina. The station models around the accident site depicted temperature-dew point spreads of 2° F or less. Mostly cloudy skies and light rain were located around the accident site at 1900. About a 5-knot wind from the south was observed east of the cold front, and wind under 10 knots was observed west of the cold front. With a light surface wind environment and small temperature-dew point spreads, it would be expected that any low clouds and mist would have remained east of the cold front.

A review of base reflectivity and lightning data revealed that the accident flight flew through base reflectivity values between 0 and 15 decibels, which were consistent with light precipitation (drizzle and light rain) at the accident site at the time of the accident. These values were also consistent with likely IMC at the flight level of the airplane at the time of the accident. There were no lightning strikes near the accident site at the time of the accident.

According to astronomical data obtained from the US Naval Observatory, on the day of the accident, sunset occurred at 1736, and civil twilight ended at 1803. Complete darkness prevailed when the accident occurred with the phase of the moon as a waxing crescent with 40 percent of the moon's visible disk illuminated. With the abundant cloud cover surrounding the accident site at the time of the accident, it is unlikely the moon provided any illumination for the accident flight.

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	30.354166,-83.610832

The airplane crashed in a pine forest about 4.5 nm north-northeast of Greenville, Florida. General

forward-to-aft crushing signatures were observed on the fuselage and both wings. Scraping damage, in a vertically down direction, was observed on adjacent trees. The engine and forward fuselage were found in a crater submerged under the ground. There was no linear wreckage path noted, and there was no evidence of fire. All of the structural components of the airframe and engine were accounted for at the scene.

The cockpit instrument panel was destroyed, and the flight and performance instruments were separated. No useful information was obtained from the instruments. The attitude indicator was not located. The turn coordinator face was destroyed.

The left wing was generally intact and remained attached to the fuselage. Crushing signatures were evident along the entire length of the leading edge in a uniform, forward-to-aft direction, and the left aileron and left flap remained attached to the wing. Manually operated push-pull tubes operated the left aileron and flap; continuity was established to the cockpit controls, and all fractures were consistent with overload.

The right wing was fragmented into several sections. The inboard section of the right wing remained attached to the fuselage. All sections of the right wing exhibited forward-to-aft crushing signatures originating at the leading edge. The right aileron and flap were separated and accounted for within the main wreckage area. Manually operated push-pull tubes operated the right aileron and flap; continuity was not established to the cockpit controls due to numerous overload fractures. The wing flaps were found in the retracted position.

The empennage was found broken away from, and adjacent to, the fuselage, and remained partially attached to the fuselage by cables. The horizontal stabilizer and elevator remained in place with buckling to the surfaces noted. The tailwheel remained attached to the empennage. The elevator remained attached to the horizontal stabilizer. The manually operated elevator trim tab was found about 20° tab down. The vertical stabilizer exhibited forward-to-aft crushing signatures and was bent right about 25° and twisted right. The rudder remained attached to the vertical stabilizer. Continuity was confirmed from the control surfaces to the cockpit; the elevator-to-cockpit controls consisted of push-pull rods, and they exhibited overload signatures. The rudder controls were cable-operated, and all breaks and cuts were consistent with overload or were made by recovery personnel.

The fuel tank was fragmented, and no residual fuel was observed. The wooden propeller blades were separated at the hub and were splintered.

Engine internal continuity was confirmed from the propeller flange to the rear accessory drives; full rotation of the crankshaft was not possible due to impact damage. The four top spark plugs were removed for examination; three of the plug electrodes were light gray in color and normal in wear compared to a Champion Check-a-Plug chart. The fourth plug was oil-soaked and showed normal wear. The carburetor was separated from the engine and was partially fragmented. The bowl was clean and dry. One float was intact, but the other float was missing.

Medical and Pathological Information

The Offices of the Medical Examiner, District Two, Tallahassee, Florida, performed autopsies of the pilot and the passenger. The autopsy reports noted the cause of death for both of them was multiple blunt traumatic injuries.

The FAA's Civil Aerospace Medical Institute performed postaccident toxicological testing on tissue specimens from the pilot and the passenger. The specimens for both of them tested negative for a wide range of drugs, including major drugs of abuse. Testing for carbon monoxide and cyanide was not performed. Although the pilot's specimens tested negative for ethanol (at a 10 percent cutoff), local toxicology testing found small amounts of ethanol consistent with postmortem production.

Additional Information

FAA Advisory Circular (AC) 60-4A, "Pilot's Spatial Disorientation," states, in part, the following:

The attitude of an aircraft is generally determined by reference to the natural horizon or other visual references with the surface. If neither horizon nor surface references exist, the attitude of an aircraft must be determined by artificial means from the flight instruments. Sight, supported by other senses, allows the pilot to maintain orientation. However, during periods of low visibility, the supporting senses sometimes conflict with what is seen. When this happens, a pilot is particularly vulnerable to disorientation. The degree of disorientation may vary considerably with individual pilots. Spatial disorientation to a pilot means simply the inability to tell which way is "up."

The AC notes that a disoriented pilot may place an aircraft in a dangerous attitude. The AC recommends that pilots "not attempt visual flight rules flight when there is a possibility of getting trapped in deteriorating weather."

Administrative Information

Investigator In Charge (IIC):	Hicks, Ralph
Additional Participating Persons:	Michael Minner; FAA/FSDO; Tampa, FL
Original Publish Date:	March 6, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=92469

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