



National Transportation Safety Board Aviation Accident Final Report

Location:	Exeter, RI	Accident Number:	NYC02FA060
Date & Time:	02/17/2002, 1752 EST	Registration:	N999N
Aircraft:	Rockwell 500S	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

The airplane was in instrument meteorological conditions and the pilot was cleared for an approach. As the airplane neared the final approach fix, the controller observed the airplane diverge from the approach course and change altitude rapidly. Shortly thereafter, the pilot said he had "all sorts of problems." The pilot requested and received vectors to an alternate airport. At 1748:29, the pilot was cleared for an ILS approach and was told to report when "established" on the approach. When asked if he was established on the ILS course, the pilot replied "I sure hope so." The controller observed the airplane descend below the published glide slope intercept altitude and advised the pilot to climb back to 2,000 feet. The pilot reported "I have problems." When asked the nature of the problem, the pilot reported "...I'm all over the place...I think I'm iced up..." Radar data indicated the airplane's radar track began following a left descending turn from 1,900 feet, about 1 minute before radar contact was lost. At 1751:33, the controller advised the pilot that his altitude was 1,000 feet, and requested that he climb to 3,000 feet. The pilot responded, "hey, I'm trying like hell." Radar contact with the airplane was lost about 1752, at 800 feet. A witness near the accident site stated he observed the airplane come out of the clouds, "wobbling" from side to side, make a "hard" left turn and strike the ground. He stated the engine was "loud" and seemed to be at "full throttle." Examination of the airplane did not reveal any pre impact mechanical malfunctions. The pilot purchased the accident airplane about 2 months prior to the accident. His total flight time in make and model was estimated to be about 200 hours. Airman's Meteorological Information (AIRMET) Zulu, Update 4, for Ice and Freezing Level was valid for the accident site area at the time of the accident. The AIRMET advised of occasional moderate rime/mixed icing in cloud in precipitation below 12,000 feet. The AIRMET reported the freezing level was from the surface to 4,000 feet. According to United States Naval Observatory astronomical data obtained for the accident site area, Sunset occurred at 1723, and the end of civil twilight was at 1751. The airplane was equipped with both wing leading edge and empennage de-icing boots. The switches for the de-icing boots were observed in the "Auto" position. The propeller de-ice and windshield anti-ice switches were observed in the "off" position.

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 control after encountering icing conditions while on approach for landing. Factors in this accident were the night light conditions and pilot's failure to select the airplane's propeller de-icing switches to the "on" position.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH

Findings

1. (F) WEATHER CONDITION - ICING CONDITIONS
2. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
3. (F) LIGHT CONDITION - NIGHT
4. (F) ANTI-ICE/DEICE SYSTEM - NOT SELECTED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On February 17, 2002, at 1752 eastern standard time, a Rockwell 500S (Twin Commander), N999N, was substantially damaged when it impacted terrain in Exeter, Rhode Island. The certificated private pilot was fatally injured. Instrument meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed for the flight that departed Wilmington International Airport (ILM), Wilmington, North Carolina, destined for Newport State Airport (UUU), Newport, Rhode Island. The business flight was conducted under 14 CFR Part 91.

According to the pilot's son, the pilot was conducting a regular flight from Naples, Florida, to Rhode Island, in furtherance of his sporting goods business.

According to information obtained from the Federal Aviation Administration (FAA), at 0759:17, the pilot contacted the Saint Petersburg Automated Flight Service Station (AFSS) and requested a weather briefing for a flight between Naples, Florida, and Wilmington, North Carolina and then to Newport, Rhode Island. At 1408:51, the pilot contacted the Raleigh AFSS and requested a weather briefing between Wilmington, North Carolina, and Newport State, Rhode Island.

According to Air Traffic Control (ATC) information provided by the FAA, and interviews of ATC personnel conducted by the Safety Board:

At 1711:51, the pilot made initial contact with Providence Approach Control and advised he had the current weather conditions at UUU. He requested the Localizer Runway 22 Approach, with a circle to land on runway 34. Radar data indicated the airplane was at 11,000 feet approximately over the Hampton, New York, VOR. The controller advised the pilot to proceed direct to UUU, and issued a descent clearance to 3,000 feet.

At 1730:53, air traffic control issued a traffic advisory to the pilot about a Cessna 402 at the "10 o'clock position, 9 miles passing left to right." The pilot responded, "I'll never see it sir my head's so stuck in these clouds."

At 1731:14, the controller observed the airplane on a course more easterly than he intended and asked the pilot to verify his heading. The pilot responded, "I am now gonna move to zero five zero."

At 1735:55, the controller advised the pilot he was cleared for the "localizer runway two two approach" and to report when "established." The pilot acknowledged the clearance.

At 1737:32, the controller advised the pilot that he appeared south of the localizer and asked if he was established on the approach. The pilot responded, "negative sir, I show myself (unintelligible) appears if I've gone through." The controller cancelled the approach clearance and instructed the pilot to turn left heading 090 degrees and maintain 2,000 feet. The pilot acknowledged the instructions.

During an interview, the controller stated that after he canceled the approach clearance, he intended to vector the airplane to the northeast for another Localizer 22 approach at UUU. He then observed the airplane's altitude readout change rapidly. At 1737:58 radar data indicated the airplane's altitude was 2,000 feet, 14 seconds later the altitude was 1,100 feet.

Approximately 27 seconds later, the airplane's altitude was 1,700 feet.

The controller stated he questioned the pilot in regards to his altitude and the pilot responded, "hold on, I'm having all sorts of problems here" and then within seconds added, "alright seventeen hundred on my way to two thousand." The controller instructed the pilot to report established on an eastbound heading. The pilot responded, "...give me a break for a minute."

At 1739:59, the controller advised the pilot, "Providence and New Bedford are minimum VFR, Providence overcast one thousand two hundred and New Bedford overcast one thousand one hundred." The pilot requested vectors to PVD.

At 1740:17, the controller instructed the pilot to climb and maintain 3,000 feet and fly a heading of 250 degrees. The controller stated he felt 3,000 feet would be better for the pilot instead of remaining at 2,000 feet because he had difficulties earlier at UUU in maintaining the correct altitude. The controller provided the pilot the weather sequence for PVD, and advised the pilot to expect the ILS Runway 5R approach. The pilot acknowledged.

From 1743:17 to 1747:11, the controller provided a series of vectors to the pilot en route to PVD. Radar data indicated the airplane's altitude and groundspeed remained constant during this time at 3,000 feet and 182 knots.

At 1747:37, the controller instructed the pilot to descend and maintain 2,000 feet and issued a wind shear alert of minus 10 knots at 500 feet on final to PVD. The pilot acknowledged.

At 1748:29, the pilot was cleared for the "ILS runway five right approach" at PVD, and instructed to report when "established." The pilot acknowledged the clearance.

At 1749:57, the pilot reported, "triple niner has the localizer." The controller asked the pilot to verify that he was established on the localizer, and the pilot responded, "I sure hope so." At this point the controller observed the airplane's altitude descend below the published minimum glide slope intercept altitude for the approach, and at 1750:32, advised the pilot, "november nine nine november you're still outside the outer marker, climb, maintain two thousand please unless you show yourself established on the localizer." The pilot acknowledged and then replied, "son of a bitch I got problems." Radar data indicated the airplane's altitude was 1,600 feet. The controller asked the nature of the problem and the pilot replied, "I'm all over the place, I have no idea I (unintelligible) I think I'm iced up."

At 1751:03, the controller advised, "november nine nine november check your altitude immediately climb and maintain three thousand altitude indicates one thousand two hundred." The pilot's response was unintelligible. Radar data indicated the airplane was at 1,200 feet. The controller stated he observed the radar target make a tight 180-degree turn.

Radar data indicated the airplane's radar track began following a left descending turn from 1,900 feet, about 1 minute before radar contact was lost.

At 1751:33, the controller advised, "november nine nine november climb and maintain three thousand altitude indicates one thousand sir." The pilot responded, "hey, I'm trying like hell." Radar data indicated the airplane was at 1,000 feet.

The last radar target with an associated altitude was recorded at 1751:42, and indicated an altitude of 800 feet.

At 1751:48, the controller advised the pilot that Quonset Airport (OQU) was off his right side and about 3 miles away. The pilot replied, "gimme something would ya." The controller instructed the pilot to "fly eastbound" and that OQU would be at his "12 o'clock position and 4 miles."

There were no further communications received from the pilot, and radar contact was lost about 1752.

A witness near the accident site stated he observed the airplane come out of the clouds, "wobbling" from side to side. The airplane then made a "hard" left turn and struck the ground. He stated the engine was "loud" and seemed to be at "full throttle."

Another witness stated the airplane just cleared the tree tops and was descending at a 45-degree angle when he lost sight of the airplane. He described the engine noise as "very loud."

The accident occurred during the hours of night, approximately 41 degrees, 34 minutes north latitude, and 71 degrees, 31 minutes west longitude.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with ratings for single and multiengine land airplanes, and rotorcraft. He also held an instrument airplane rating. The pilot's logbooks were not recovered. He reported 860 hours of total flight experience, with 47 hours accumulated in the previous 5 months, on his most recent application for a FAA second class medical certificate, which was dated on August 21, 2001.

The pilot's multiengine rating was issued on December 17, 1999. At that time, he reported 656 hours of total flight experience, which included 435 hours in airplanes, and 142 hours of instrument flight time. The pilot purchased the accident airplane in December 1999. His total flight time in make and model was estimated to be about 200 hours.

AIRCRAFT INFORMATION

The accident airplane was manufactured in 1976, and was powered by two Lycoming IO-540-E1B5, 290-horsepower engines, which each drove a Hartzell 3-Blade, constant-speed, full-feathering propeller.

The airplane was maintained at UUU by a local fixed base operator. Review of the airplane's maintenance records revealed that it had been operated for about 106 hours since its most recent annual inspection, which was performed on June 18, 2001. The airplane's most recent static system test was performed during September 1999.

At the time of the accident, both the left and right engines had accumulated approximately 295 hours since there were overhauled in March 1999. Additionally, both engines had been operated for about 1,955 total hours since new.

At the time of the accident, both the left and right propellers had accumulated approximately 295 hours since there were overhauled in April 1999.

METEOROLOGICAL INFORMATION

The weather briefing provided to the pilot included occasional mixed rime icing below 8,000 feet in the vicinity of northern New Jersey and below 12,000 feet in the vicinity of Rhode Island

and Connecticut.

Surface weather observations and National Weather Service (NWS) analysis charts indicated that widespread low stratocumulus/stratus clouds were present in the New England area with a moderate to strong northwesterly-northerly low-level flow on the backside of a low pressure system off the coastline. Satellite and radar imagery indicated layered clouds and patchy light rain through the region.

Weather observations reported at airports in the vicinity of the accident site area, were as follows:

PVD (11 miles north-northeast of the accident site) at 1751: wind from 350 degrees at 10 knots; visibility 6 statute miles with light rain and mist; ceiling 1,000 feet overcast; temperature 3 degrees C, dew point 2 degrees C; altimeter 29.69.

OQU (6 miles east-northeast of the accident site) at 1745: wind from 350 degrees at 10 knots; visibility 7 statute miles with light rain; ceiling 1,500 feet broken, 2,500 feet overcast; temperature 4 degrees C; dew point (missing); altimeter 29.71.

UUU (13 miles east-southeast of the accident site) at 1753: wind from 330 degrees at 10 knots with 17 knot gusts; visibility 8 statute miles with unknown precipitation; ceiling 700 feet overcast; temperature 3 degree C; dew point 2 degrees C; altimeter 29.68.

Airman's Meteorological Information (AIRMET) Zulu, Update 4, for Ice and Freezing Level was valid for the accident site area at the time of the accident. The AIRMET advised of occasional moderate rime/mixed icing in cloud in precipitation below 12,000 feet. The AIRMET reported the freezing level was from the surface to 4,000 feet.

Upper air data indicated that the freezing level in the Providence area was approximately 2,000 feet, which was also confirmed by the controller.

Pilot reports obtained from the National Weather Service (NWS) archive indicated occasional trace to light rime icing above the freezing level was being reported in the area of the accident site. One report of moderate mixed icing was observed near the Boston VOR between 6,000 and 10,000 feet. The on-duty controller said that trace rime icing had been reported in the area before the accident between 4,000 and 4,500 feet. He also said that another airplane in the area did not report icing or significant weather around the accident time.

WRECKAGE INFORMATION

The airplane impacted trees and small boulders before it came to rest upright, with its right wing resting on the ground in a field. The initial tree strike was approximately 70 feet from the main wreckage, which was oriented on a 350 degree heading. The debris path was on a 050 degree heading. Portions of freshly cut tree branches up to about 2 inches in diameter, which contained black paint transfer, were observed along the debris path.

All major portions of the airplane were accounted for at the accident sight. The front left portion of the airplane, which included the cockpit area, was crushed and displaced upward. The left side of the fuselage was buckled and distorted forward of the battery access panel. The outboard 7 feet of the left wing was separated and contained a circumferential indentation, which was compressed aft. The portion of the wing which remained attached to the airplane was bent upward and contained significant leading edge impact damage. Additionally, the left aileron was separated and located in the debris path. The empennage, which included the

vertical and horizontal stabilizers, was not damaged. The right wing remained attached to the airplane, and except for the wing tip, it contained minor leading edge damage. An estimated 25 gallons of fuel consistent with aviation gasoline was found in the right wing fuel tank.

Flight control cable continuity was confirmed from the left and right ailerons to their respective wing roots, and from the elevator and rudder control surfaces to the aft cabin area. Due to impact damage, flight control continuity could not be verified further.

The landing gear handle was observed in the "up" position. The left main landing gear was observed in a down, but unlocked position. The right main landing gear was observed extended out from the wheel well and resting on the ground beneath the right wing. The nose gear position could not be confirmed.

The flaps were observed in a partially extend position. After recovery of the airplane, a flap actuator measurement corresponded to a setting of 13.66 degrees; however, it was noted that the actuator piston moved freely.

The airplane was equipped with both wing leading edge and empennage de-icing boots. The switches for the de-icing boots were observed in the "Auto" position. The propeller de-ice and windshield anti-ice switches were observed in the "off" position. Additionally, the windshield anti-ice alcohol reservoir was empty. The right-hand pitot heat switch was selected to the "on" position, and the left-hand pitot heat switch was observed in the "off" position.

Both engines were separated from their respective attach points, but remained connected to the airplane via cables and wires. Additionally, both propellers remained attached to their respective engines. The propellers contained chord wise scratches and leading edge gouges.

The propeller was removed from the right engine and the crankshaft was rotated via the crankshaft flange. Thumb compression and valve train continuity was attained on all cylinders except the number 6 cylinder, and number 6 cylinder intake valve. Further examination of the number 6 cylinder revealed that the intake pushrod and pushrod housing sustained impact damage. After the pushrod was removed, compression was attained on the number 6 cylinder. The spark plugs were removed and their electrodes were intact, gray in color, and contained some lead deposits. An electrical timing unit was used to determine that the right and left magnetos were timed to approximately 25 degrees. Both magnetos were then removed and produced spark on all towers when rotated by hand. Fuel was observed in the engine driven fuel pump, fuel servo, and fuel manifold. Additionally, the fuel injector inlet screen was absent of debris. All fuel nozzles were removed and observed to be unobstructed. The oil filter was removed and the filter element was also observed to be absent of contamination.

The propeller was removed from the left engine and the crankshaft was rotated via the crankshaft flange. Thumb compression and valve train continuity was attained on all cylinders. The spark plugs were removed and their electrodes were intact and light gray in color, except for the number 1 and 3 bottom spark plugs, which were oil soaked. An electrical timing unit was used to determine that the right and left magnetos were timed to approximately 25 degrees. Both magnetos were then removed and produced spark on all towers when rotated by hand. Fuel was observed in the engine driven fuel pump and fuel servo. Additionally, the fuel injector inlet screen was absent of debris. All fuel nozzles were removed and observed to be unobstructed. The oil filter was removed and the filter element was also observed to be absent of contamination.

Both vacuum pumps were removed and rotated freely. Additionally, their shear shafts and vanes were intact.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot, on February 18, 2002, by the State of Rhode Island Office of Medical Examiners, Providence, Rhode Island.

The toxicological testing report from the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma, was negative for drugs and alcohol for the pilot.

TESTS AND RESEARCH

The directional gyro was retained and examined at Honeywell, Wichita, Kansas, on March 11, 2002, under the supervision of an FAA inspector. The directional gyro sustained some minor impact damage; however, it functioned within tolerances.

The airplane's de-icing distributor valve and boot timers were retained and examined at Goodrich, Uniontown, Ohio, on March 13, 2002, under the supervision of an FAA inspector, and all components functioned properly when tested.

The GPS unit was forwarded to its manufacturer, Garmin International Inc., Olathe, Kansas, where it was examined on April 17, 2002, under the supervision of an FAA inspector. Due to the significant amount of impact damage to the unit, no useful information was obtained. Additionally, a representative from Garmin reported that the unit was not capable of storing track log information.

ADDITIONAL INFORMATION

Re-fueling

The airplane was refueled at ILM with 120 gallons of aviation gasoline.

Sunset Data

According to United States Naval Observatory astronomical data obtained for the accident site area, Sunset occurred at 1723, and the end of civil twilight was at 1751.

Wreckage Release

The main airplane wreckage was released on February 28, 2002, to a representative of the owners insurance company. The retained components were released on September 6, 2002.

Pilot Information

Certificate:	Private	Age:	58, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	08/21/2001
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	900 hours (Total, all aircraft), 200 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Rockwell	Registration:	N999N
Model/Series:	500S	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	3277
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	06/18/2001, Annual	Certified Max Gross Wt.:	6750 lbs
Time Since Last Inspection:	106 Hours	Engines:	2 Reciprocating
Airframe Total Time:	2145 Hours at time of accident	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-540-E1B5
Registered Owner:	Lewis N. Madeira	Rated Power:	290 hp
Operator:	Lewis N. Madeira	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Night
Observation Facility, Elevation:	PVD, 55 ft msl	Distance from Accident Site:	11 Nautical Miles
Observation Time:	1751 EST	Direction from Accident Site:	25°
Lowest Cloud Condition:		Visibility	6 Miles
Lowest Ceiling:	Overcast / 1000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	350°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.69 inches Hg	Temperature/Dew Point:	3°C / 2°C
Precipitation and Obscuration:			
Departure Point:	WILMINGTON, NC (ILM)	Type of Flight Plan Filed:	IFR
Destination:	NEWPORT, RI (UUU)	Type of Clearance:	IFR
Departure Time:	1445 EST	Type of Airspace:	Class E

Airport Information

Airport:	THEODORE FRANCIS GREEN STATE (PVD)	Runway Surface Type:	Asphalt
Airport Elevation:	55 ft	Runway Surface Condition:	Wet
Runway Used:	5R	IFR Approach:	ILS
Runway Length/Width:	7166 ft / 150 ft	VFR Approach/Landing:	None

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:	41.577778, -71.523333

Administrative Information

Investigator In Charge (IIC): Luke Schiada **Report Date:** 01/16/2003

Additional Participating Persons: David O'Donnell; Bedford, MA
David Moore; Ardsley, PA
Geoffrey A Pence; Arlington, WA
Neil Luban; West Suffield, CT
Alvan S Moder; Warwick, RI

Publish Date:

Investigation Docket: NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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](#).