Aviation Investigation Final Report

Location:	Cannon Falls, Minnesota	**Accident Number:**	CHI07FA176
Date & Time:	June 22, 2007, 14:17 Local	**Registration:**	N3671S
Aircraft:	Beech A36TC	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private, non-instrument rated pilot departed in visual meteorological conditions (VMC) and requested visual flight rules (VFR) flight following to his destination. When he neared his destination, he contacted approach control and reported that his altitude was 2,500 feet above mean sea level (msl). Approach control informed the pilot that there were moderate to heavy rain showers over the destination airport. The pilot reported that he was experiencing "poor visibility" and was considering turning 180 degrees to "go back." Approach control informed the pilot that instrument meteorological conditions prevailed north of his position with moderate to heavy rain showers. The pilot reported, "We're, we're kinda in the soup at this point." The pilot reported that he was turning to the south and soon after the airplane was lost from radar contact. A witness reported that he heard an airplane and then saw the accident airplane descending through a cloud layer that was about 400 - 500 feet above the ground. The airplane was in about a 50-degree nose down attitude with the airplane's engine producing "cruise power." He reported that the airplane was flying at a high rate of speed for about four seconds until he heard the airplane impact the terrain. The observed weather in the area of the accident was reported as marginal VMC and instrument meteorological conditions. The inspection of the airplane revealed no preexisting anomalies.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's continued flight into instrument meteorological conditions, which resulted in spatial disorientaton and loss of control.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: CRUISE

Findings
1. (C) VFR FLIGHT INTO IMC - PERFORMED - PILOT IN COMMAND
2. (C) SPATIAL DISORIENTATION - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: CRUISE

Findings
3. AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On June 22, 2007, at 1417 central daylight time, a Beech A36TC Bonanza, N3671S, was destroyed when it departed from cruise flight and impacted terrain about 10 miles south of Cannon Falls, Minnesota. The 14 Code of Federal Regulations Part 91 personal flight departed DuPage Airport (DPA), West Chicago, Illinois, about 1230 and was en route to Air Lake Airport (LVN), Lakeville, Minnesota. The pilot, the sole occupant, was fatally injured. Marginal visual meteorological conditions (VMC) prevailed at LVN at the time of the accident. No flight plan was filed.

The private pilot departed DPA in VMC. When the flight was near Wisconsin Dells, Wisconsin, the pilot requested visual flight rules (VFR) flight following, and a discrete transponder code was assigned to N3671S. The flight continued to receive VFR flight following while en route to LVN. At 1410:50, the pilot contacted Minneapolis Approach Control and reported that his altitude was 2,500 feet above mean sea level (msl). Approach control instructed the pilot that he could proceed direct to LVN, and informed him that there was moderate to heavy rain showers over LVN at the time.

At 1413:08, the pilot reported to approach control that he was experiencing "poor visibility" and asked what the weather conditions were like ahead of him. He stated that he was considering turning 180 degrees to "go back." Approach control informed the pilot that instrument meteorological conditions (IMC) prevailed north of his position with moderate to heavy rain showers.

At 1413:45, approach control asked the pilot if he was going to reverse course. The pilot replied, "Ah, affirmative, yea we're gonna make, we're gonna actually head, ah, due north." Approach control instructed the pilot to proceed to the northeast and maintain VFR.

At 1414:53, approach control asked the pilot what was his current destination. The pilot responded, "We're deviating. I think we're going to go back over near Eau Claire, but, ah, we're going to see what the weather is like. We're, we're kinda in the soup at this point so I'm trying to get back, ah, to the east."

At 1415:10, approach control informed the pilot that there was "some level one rain or some light rain showers" that were about seven miles ahead of his present position.

At 1415:30, the pilot asked approach control, "What is the ah, ah, Lakeville weather? I was showing seven thousand and overcast on the system here. Is that still holding?" Approach control responded, "No, around [the] Minneapolis area we're overcast at twenty three hundred

and twenty one hundred in the vicinity of all the other airports around here."

At 1415:49, the pilot stated, "I'm going to head due south at this time, down to, ah, about two thousand and make it into Lakeville." Approach control responded, "November three six seven one sierra, roger, you can proceed south bound."

At 1416:02, the pilot responded, "Seven one sierra, thanks (unintelligible)." The radar data indicated that the airplane's altitude was about 2,600 feet msl.

There were no further radio transmissions from N3671S. After the last radio transmission, three radar returns indicated the airplane descended from 2,500 feet to 2,300 feet msl before it was lost from radar contact.

A witness reported that he heard an airplane and then saw it descending through a cloud layer that was about 400 - 500 feet above the ground. He reported that the airplane was in about a 50-degree nose down attitude. He reported that he heard the airplane's engine producing "cruise power" and there were no indications of an engine malfunction such as sputtering. He reported that the airplane was flying at a high rate of speed. He saw the airplane traveling on an east to west heading for about four seconds when the airplane went behind a tree line. He reported that he heard the airplane impact the terrain. He reported that he called 911 and then went to the accident site to render assistance, if possible.

PERSONNEL INFORMATION

The pilot held a private pilot's certificate that was issued in August 1999. He was not instrument rated. The pilot's flight logbook that dated back to 2002 indicated that he had about 461 hours of total flight time with about 17 hours in make and model. He attended a Bonanza Initial Training Course in January 2007, and received 8 hours of simulator training in a BE-36 flight simulator. He flew 13.9 hours in the accident airplane between January 17 - 25, 2007. His logbook indicated that he had not flown since January 25, 2007. He had flown the accident airplane to DPA on May 10, 2007, for an avionics upgrade, but the flight was not entered into the pilot's logbook. There were no logbook entries that indicated he had received any actual or simulated instrument training other than the 8 hours of simulator training in January 2007. He held a third-class medical certificate that was issued on September 8, 2005.

AIRCRAFT INFORMATION

The airplane was single engine Beech A36TC Bonanza, serial number EA-95. The airplane seated six and had a maximum gross weight of 3,833 pounds. The engine was a 300-horsepower Continental TSIO-520-UB engine. The last annual inspection was conducted on November 8, 2007. The airplane had flown 37 hours since the last annual inspection and had a total time of 3,391 hours. According to insurance records, the pilot purchased the airplane on January 3, 2007.

The airplane was delivered to an aircraft repair station at DPA on May 10, 2007, for an avionics upgrade. Among other things, the installed avionics included a Garmin GNS-430W GPS, a Garmin GMX-200 MultiFunction Display (MFD), and a Garmin GDL -69A XM/WX Data Link Receiver. The newly installed avionics system provided the pilot with the ability to obtain the following types of weather displays in the cockpit: Next-generation Radar (NEXRAD), Aviation Routine Weather Report (METARS), Terminal Area Forecasts (TAF's), temporary flight restrictions (TFR's), winds aloft, echo tops, precipitation type at the surface, lightning strikes, storm-cell data, Airman's Meteorological Information (AIRMET's), and Significant Meteorological Advisories (SIGMET's). During the ground tests after the avionics were installed, the Garmin 430W had a discrepancy noted against it, so it was replaced with a new Garmin 430W prior to the accident flight.

METEOROLOGICAL INFORMATION

The closest weather reporting facility to the accident site was Stanton Airfield (SYN), Stanton, Minnesota, located approximately 10 miles northwest of the accident site. The airport was equipped with an Automated Weather Observing System (AWOS-3), which issues observations every 20-minutes. The following conditions surrounding the time of the accident were reported:

At 1355, the automated SYN weather observation was: wind from 140 degrees at 6 knots, visibility 5 miles in moderate rain, ceiling overcast at 1,300 feet, temperature 18 degrees Celsius (C), dew point temperature 17 degrees C, altimeter setting 30.04 inches of Mercury (Hg). Remarks: automated observation system, hourly precipitation 0.11 inches, lightning distant southwest.

At 1415: wind from 130 degrees at 6 knots, visibility 4 miles in moderate rain, ceiling overcast at 1,300 feet, temperature 18 degrees C, dew point 17 degrees C, altimeter setting 30.04 inches of Hg. Remarks: automated observation system, hourly precipitation 0.04 inches.

At 1435: wind from 150 degrees at 7 knots, visibility 5 miles in light rain, ceiling overcast at 1,300 feet, temperature 18 degrees C, dew point 17 degrees C, altimeter setting 30.03 inches of Hg. Remarks: automated observation system, hourly precipitation 0.05 inches.

The planned destination was Airlake Airport (LVN), Minneapolis, located approximately 20 miles northwest of the accident site at an elevation of 960 feet msl. The airport was equipped with an AWOS-3 system and reported the following conditions surrounding the period:

At 1355, the automated LVN weather observation was: wind from 120 degrees at 6 knots, visibility 2 1/2 miles in heavy rain, ceiling overcast at 1,400 feet, temperature 19 degrees C, dew point 16 degrees C, altimeter 30.06 inches of Hg. Remarks: automated weather observation system, visibility 1 variable 5 miles, hourly precipitation 0.13 inches.

At 1415: wind from 130 degrees at 4 knots, visibility 10 miles in light rain, ceiling overcast at 1,400 feet, temperature 18 degrees C, dew point 16 degrees C, altimeter 30.05 inches of Hg.

Remarks: automated weather observation system, hourly precipitation 0.07 inches, lightning distant north.

At 1435: wind from 090 degrees at 5 knots, visibility 7 miles in moderate rain, scattered clouds at 900 feet, ceiling overcast at 1,400 feet, temperature 18 degrees C, dew point 16 degrees C, altimeter 30.05 inches of Hg. Remarks: automated weather observation system, hourly precipitation 0.09 inches.

Rochester International Airport (RST), Rochester, Minnesota, located approximately 33 miles south-southeast of the accident site at an elevation of 1,317 feet msl, was equipped with an Automated Surface Observing System (ASOS) and augmented by certified NWS observers. The following conditions were reported surrounding the period:

At 1354, the RST weather observation was: winds from 110 degrees at 6 knots, visibility 1 1/2 miles in moderate rain and mist, ceiling broken at 200 feet, overcast at 500 feet, temperature 16 degrees C, dew point 15 degrees C, altimeter 30.09 inches of Hg. Remarks: automated observation system, sea level pressure 1018.9-hPa, hourly precipitation 0.48 inches, temperature 16.1 degrees C, dew point 15.0 degrees C.

At 1428: winds from 100 degrees at 8 knots, visibility 3 miles in light rain and mist, ceiling broken at 400 feet, overcast at 700 feet, temperature 16 degrees C, dew point 15 degrees C, altimeter 30.08 inches of Hg. Remarks: automated observation system, surface visibility 4 miles, hourly precipitation 0.05 inches.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted the terrain in a cornfield. The longitudinal axis of the airplane was aligned with 340 degrees magnetic heading. The wreckage path indicated an impact angle that was consistent with about a 50 - 60 degrees nose down attitude. The major sections of the airplane came to rest at the initial impact site. Small pieces of the windshield, pieces of the fuel bladders, and a section of the engine cowling were found in the debris field that was spread out to the north of the impact site. Fuel blight was observed on the corn crop out to about 160 feet in front of the wreckage. There was no sign of impact or aircraft debris south of the initial impact site.

Wreckage recovery revealed that the engine was located about 4 - 5 feet under the ground, and that the engine remained attached to the fuselage. The propeller hub was broken and two of the three blades were broken loose from the hub. The cockpit instrument panel received impact crush damage, and some of the instruments were broken out of their respective panel mounts. The engine tachometer needle was stuck at about 2,500 rpm and the tachmeter read 3,393.24 hours. The airspeed indicator's needle was stuck at about 202 knots. The navigation and communication stack received crush damage. The roof of the fuselage and cabin exhibited forward bending and buckling from the impact.

The left wing remained attached to fuselage and it exhibited forward crushing and buckling. The left wing fuel bladder was destroyed and the wing skin was split and bent upward, and it exhibited bulging consistent with "hydraulicing" fuel. The left landing gear was found in the retracted position. The aileron and flap remained attached to the left wing. The flap was found in the up position. The aileron cable exhibited continuity from the aileron bellcrank to the fuselage. The wingtip fuel tank remained attached to the wing, but the forward section of the fuel tank was broken.

The right wing remained attached to the fuselage, but it was found buckled forward of its normal position. The right wing fuel bladder was destroyed and the wing skin was split and bent upward, and it exhibited bulging consistent with "hydraulicing" fuel. The right landing gear was found in the retracted position. The aileron and flap remained attached to the right wing. The flap was found in the up position. The aileron cable exhibited continuity from the aileron bellcrank attach points to the fuselage. The wingtip fuel tank remained attached to the wing, but the outboard one-half of the fuel tank was broken.

The empennage remained attached to the fuselage, but it was buckled forward at the leading edge of the vertical stabilizer. The rudder and the rudder counterweight remained attached to the vertical stabilizer. The rudder cables exhibited continuity to the aft cabin. The left and right horizontal stabilizers had leading edge crush damage. The left and right elevators, counterweights, and trim tabs remained intact and attached to the horizontal stabilizers. The elevator cables exhibited continuity from the control surfaces to the aft cabin. The elevator trim tab cables had continuity to the tab surfaces, but the trim tubes were buckled within the horizontal stabilizers from impact damage.

The inspection of the engine revealed that the crankshaft rotated and the engine had drive train continuity to the accessory drive gears. The four aft cylinders exhibited compression and suction. The front two cylinders did not have suction or compression, but the pistons had full up and down travel. The right front cylinder's valve cover was broken and had dirt impacted in the cylinder head. Both magnetos were separated from the engine and both had impact damage that prevented them from producing spark. The top six spark plugs were removed and no anomalies were noted. The fuel servo had impact damage and the fuel lines to the fuel nozzles were broken. The vacuum pump was broken from the mounting flange.

The three-bladed propeller hub was broken by impact forces. One blade marked "A" remained attached to the hub but it was free to rotate. Blade A was bent forward about 16 inches from the hub. The propeller blade marked "B" was broken out of the hub and was found in the dirt under the engine at the accident site, about 5 - 6 feet under the surface of the terrain. The outboard 22 inches of the blade exhibited a twist to the low pitch side. The blade marked "C" was broken from the hub and was found next to the engine about 4 - 5 feet below the surface. The outboard 10 - 12 inches of blade C was broken off and not located. The fracture surface was consistent with overload. Blade C had numerous gouges on the leading edge of the blade and the outboard 10 inches of the remaining blade exhibited a twist to the low pitch side.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed at the Regina Medical Center, Hastings, Minnesota, on June 25, 2007. A Forensic Toxocology Fatal Accident Report was prepared the FAA Civil Aeromedical Institute. The results of the test indicated 13 (mg/dL, mg/hg) ethanol detected in the liver and 26 (mg/dL, mg/hg) ethanol detected in the muscle. Putrefaction was present in the samples tested and no blood, urine, or vitreous fluids were available for testing.

ADDITIONAL INFORMATION

A representative of the aircraft repair facility at DPA where the upgraded avionics installation was performed reported that the pilot received the operating manuals for the equipment that was being installed. The representative reported that he and the pilot reviewed the operating procedures for the Garmin 430W GPS, the MFD, and the XM-Weather in the airplane for about three hours on June 21, 2007. They practiced using the same equipment for about one hour on June 22, 2007, before the pilot departed on the accident flight.

The representative reported that the pilot was "pretty proficient" with the newly installed avionics and had the basic functions "down pretty good" - enough for a "basic VFR flight plan." He reported that the pilot wanted to be proficient with the XM-Weather and the map function on the MFD. The pilot checked the en route weather to his destination using the on-board XM-Weather capabilities, but did not get a weather briefing after they had finished reviewing the operation of the new avionics equipment. After the one hour of training on the equipment, the portable power cart was disconnected and the pilot departed.

Pilot Information

Certificate:	Private	**Age:**	43,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	September 1, 2005
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 1, 2006
Flight Time:	461 hours (Total, all aircraft), 17 hours (Total, this make and model), 2 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N3671S
Model/Series:	A36TC	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	EA-95
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	November 1, 2007 Annual	**Certified Max Gross Wt.:**	3833 lbs
Time Since Last Inspection:	37 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3393 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520-UB
Registered Owner:	Brian Fischer	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LVN,960 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	14:15 Local	**Direction from Accident Site:**	315°
Lowest Cloud Condition:		**Visibility**	5 miles
Lowest Ceiling:	Overcast / 1400 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	110°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	18°C / 17°C
Precipitation and Obscuration:	N/A - None - Rain		
Departure Point:	West Chicago , IL (DPA)	**Type of Flight Plan Filed:**	None
Destination:	Lavkeville, MN (LVN)	**Type of Clearance:**	VFR flight following
Departure Time:	12:30 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	44.369445,-92.834999

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Anthony Paciolla; FAA-Minneapolis FSDO; Minneapolis, MN
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Investigation Class:	Class
Note:	
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