



National Transportation Safety Board Aviation Accident Final Report

Location:	Charlevoix, MI	Accident Number:	CEN11FA417
Date & Time:	06/24/2011, 1935 EDT	Registration:	N88MN
Aircraft:	BEECH A36	Aircraft Damage:	Substantial
Defining Event:	Aerodynamic stall/spin	Injuries:	2 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

Witnesses observed the airplane exiting the low cloud ceiling halfway down the runway during an instrument approach. The cloud ceiling was about 200 feet above ground level (agl). The pilot did not execute the published missed approach procedure. Instead, he maneuvered the airplane in the vicinity of the airport at a low altitude and entered the right downwind leg of the traffic pattern for the runway. Witnesses observed the airplane turn to the right toward the runway, pitch nose up, bank to the left, stall, and enter an uncontrolled descent. A postaccident examination of the airframe and engine revealed no evidence of any preimpact failure or malfunction. The circling approach weather minimums were a 700-foot agl ceiling and 1 mile visibility. Based on the witness reports and examination of the impact damage, it is likely the pilot inadvertently stalled the airplane at a low altitude during the downwind-to-base turn.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate airspeed while maneuvering at low altitude, which resulted in an aerodynamic stall. Contributing to the accident was the pilot's decision to not execute a missed approach in weather conditions below minimums.

Findings

Aircraft	Airspeed - Not attained/maintained (Cause)
Personnel issues	Incorrect action performance - Pilot (Cause) Aircraft control - Pilot (Cause)
Environmental issues	Low ceiling - Effect on operation Below approach minima - Decision related to condition (Factor)

Factual Information

HISTORY OF FLIGHT

On June 24, 2011, approximately 1935 eastern daylight time, a Beech A36 single-engine airplane, N88MN, sustained substantial damage when it impacted terrain and a residential garage while maneuvering near Charlevoix, Michigan. The private pilot, one passenger, and one dog sustained fatal injuries, one passenger sustained serious injuries, and one dog was not injured. The airplane was registered to Microjet, LLC, Fort Wayne, Indiana, and operated by the pilot. Instrument meteorological conditions prevailed and an instrument flight rules (IFR) flight plan had been filed for the 14 Code of Federal Regulations Part 91 personal flight. The flight had departed Smith Field Airport (SMD), Fort Wayne, Indiana, approximately 1730.

According to Federal Aviation Administration (FAA) Minneapolis air route traffic control center (ARTCC) communications and radar data, the pilot filed an IFR flight plan from SMD to Boyne City Municipal Airport (N98), Boyne City, Michigan. At 1848, the pilot stated he wanted to divert to Boyne Mountain Airport (BFA), Boyne Falls, Michigan, due to weather in the area of N98 which did not have an instrument approach. The pilot requested the BFA RNAV (global positioning system (GPS)) approach to runway 35. The pilot was then cleared to ELBOT which was the initial approach fix for the RNAV approach. At 1917, the pilot contacted Minneapolis ARTCC and stated he was executing the missed approach at BFA and requested the Charlevoix Municipal Airport (CVX) RNAV (GPS) approach to runway 27. The pilot was cleared to COKOS which was the initial approach fix for the RNAV approach. At 1920, the pilot was cleared for the approach to CVX. At 1926, the pilot was then given approval for a frequency change to the CVX advisory frequency. The pilot acknowledged the frequency change.

Witnesses, who were located in the CVX terminal building, overheard the pilot call on the CVX common traffic advisory frequency (CTAF) that he was executing the GPS runway 27 instrument approach. The witnesses reported that the cloud ceiling was 200 feet above ground level (agl) and the visibility was 1 mile at the time the pilot called CTAF to report the approach. The witnesses observed the airplane break out of the clouds approximately halfway down runway 27. They heard the airplane's engine increase power and observed the airplane enter a left turn, then a turn back to the right around a water tower located southwest of CVX. The airplane stayed approximately 200 feet agl during the turn around the airport. The airplane then entered a right downwind leg for runway 27. Witnesses observed the airplane begin a right turn toward runway 27, pitch nose up, and then roll to the left in a nose high attitude. The airplane then disappeared behind a tree line and airport buildings.

Another witness, who was located at a baseball field approximately 1/4 mile west of the accident site, reported he observed the airplane appear from the clouds heading to the west approximately 200 feet agl during the approach. At that time, the airplane appeared to be between the runway and the baseball field. The witness then turned his attention back to the baseball game. A few minutes later, the witness observed the airplane overflying the baseball field at a low altitude and airspeed. The airplane was traveling to the east and began to make a right turn toward the airport. At that time, the airplane's nose pitched up and the "tail dropped and fluttered." The airplane then banked to the left, appeared out of control, and dropped. The witness lost sight of the airplane behind trees and observed a "fuel spray" after the impact.

The airplane impacted the yard of a residence adjacent to the north perimeter of CVX. The airplane came to rest upright, partially within a three stall garage attached to the residence.

Rescue and law enforcement personnel arrived on scene shortly after the accident. One dog was found deceased at the accident site, and one dog was found the day after the accident walking around the surrounding neighborhood.

PERSONNEL INFORMATION

The private pilot held single-engine land and instrument airplane ratings. The pilot reported 1,300 total flight hours on his FAA third-class medical certificate dated May 25, 2010.

The pilot's logbook was recovered from the accident airplane. The logbook, identified as logbook number 3, did not contain a total hour amount forwarded from his previous logbook. The first logbook entry was dated February 28, 2004, for a flight in the accident airplane, and the last entry was dated June 19, 2011, for a flight in the accident airplane.

In the recovered logbook, the pilot recorded 2 flights to CVX with the note "GPS" in the respective flight log entry. The most recent flight to CVX was recorded on May 29, 2009.

The pilot most recent instrument proficiency check was completed on June 25, 2010, and at the time of the accident, the pilot logged 19 instrument approaches since the check.

The pilot and passenger who sustained serious injuries were involved in an airplane accident on September 1, 2003 (see NTSB Aviation Accident Report CHI03FA291). The pilot was also pilot-in-command at the time of that accident.

AIRCRAFT INFORMATION

The airplane was a Beech A36, serial number E-741. It was powered by a AV Power IO-550-B-AP turbocharged engine (Supplemental Type Certificate (STC) AV Power STC SE02881AT), serial number 274546-R, and a three-bladed, constant speed Hartzell propeller. The airplane was originally equipped with a 285-horsepower normally aspirated Continental Motors IO-520 series engine. A review of the FAA airworthiness records, and verified by the affixed engine data plates and hardware installation, revealed that the installed engine had been modified by an A.E.R.O. Aviation Company, Inc. STC as stated above. The modified engine was further modified with the installation of a Western Skyways turbo normalizer system STC (STC SE8677SW).

The airplane was issued a standard airworthiness certificate on August 20, 1975, and was registered to Microjet, LLC, on May 15, 2003. The airplane was configured with four seats.

The airplane was equipped with a Garmin GNS 530W GPS, a Garmin GNC 300XL TSO GPS, and a Garmin GDL 69 XM Data Link System.

A review of the airplane's maintenance records showed that an annual inspection was performed on the airframe on December 12, 2010, at 5,514 total airframe hours. The digital tachometer reading at the accident site was not available due to damage.

METEOROLOGICAL INFORMATION

At 1914, the CVX automated weather observing system (AWOS) reported the wind from 260 degrees at 9 knots, visibility 1 3/4 miles, mist, sky broken at 400 feet, overcast clouds at 700 feet, temperature 11 degrees Celsius, dew point 10 degrees Celsius, and an altimeter setting of 29.71 inches of Mercury.

At 1935, the CVX AWOS reported the wind from 260 degrees at 9 knots, gusting to 15 knots, visibility 2 miles, rain, overcast clouds at 200 feet, temperature 11 degrees Celsius, dew point 11

degrees Celsius, and an altimeter setting of 29.72 inches of Mercury.

At 1954, the CVX AWOS reported the wind from 250 degrees at 10 knots, gusting to 14 knots, visibility 2 miles, drizzle, overcast clouds at 200 feet, temperature 11 degrees Celsius, dew point 10 degrees Celsius, and an altimeter setting of 29.72 inches of Mercury.

No airmen's meteorological information (AIRMETs) or significant meteorological information (SIGMETs) were active for the accident location at the accident time.

AIRPORT INFORMATION

The Charlevoix Municipal Airport, CVX, is a public, uncontrolled airport located 1 mile southwest of Charlevoix, Michigan, at 45 degrees, 18.286 minutes north latitude, and 085 degrees, 16.520 minutes west longitude, at a surveyed elevation of 669 feet mean sea level (msl). The airport features one asphalt runway, Runway 9/27, which is 4,550 feet by 75 feet, and one turf runway, Runway 4/22, which is 1,280 feet by 200 feet.

Runway 27 was equipped with medium-intensity runway edge lights, runway end identifier lights, and a 4-light, 3 degree glidepath precision approach path indicator (PAPI) located on the right side of the runway. Runway 27 was configured for non-precision approaches, which included RNAV (GPS) and non-directional beacon (NDB).

The RNAV approach to runway 27 at CVX included an inbound course of 270 degrees. The minimum descent altitude (MDA) was 1,100 feet msl. The weather minimums for the RNAV (GPS) runway 27 approach were a MDA of 500-feet and 1 mile visibility for the straight-in approach. The published missed approach procedure instructed the pilot to conduct a "climbing left turn to 3,000 direct to COKOS and hold."

WRECKAGE AND IMPACT INFORMATION

The accident site showed that the initial ground scar, located approximately 75 feet from the main wreckage, contained the left wing tip fuel tank fairing and pitot tube. The initial impact to the main wreckage was distributed along a measured magnetic heading of 090 degrees. The main wreckage consisted of the fuselage, engine, empennage, and both wings. The three-bladed propeller was separated from the engine crankshaft and came to rest adjacent to the main wreckage. Miscellaneous baggage and airplane debris were noted to the west of the main wreckage.

The left wing was partially separated from the fuselage. The leading edge was crushed aft, and the outboard 5 feet was crushed upward and aft. The fuel tank fairing was separated. The aileron was separated and came to rest on the top of the left wing surface. The flap was partially separated, and the flap actuator was found in the retracted position, consistent with the flap being retracted. The left main landing gear wheel was separated, and the strut was in the extended position. The wing fuel tank was compromised.

The right wing was partially separated and came to rest within the garage structure. The leading edge was bent aft. The aileron and flap control surfaces were separated. The flap actuator was found in the retracted position, consistent with the flap being retracted. The right main landing gear was separated and found in the extended position.

Rescue personnel reported fuel was draining from the airplane's fuel tanks upon their arrival.

The forward fuselage was crushed and deformed. The left garage structure support post was separated and the right garage structure support post was located within the cockpit area. The

left side wall of the fuselage was intact and contained buckling from front to aft. The right side of the fuselage crushed and deformed. The right forward cabin door was separated and the door posts were cut by rescue personnel. The cabin utility doors were found in the open position, consistent with the rescue personnel information during rescue efforts for the passenger. The instrument panel was crushed and displaced to the right. The throw-over control yoke was found in the left seat position. The throttle, mixture, and propeller cockpit controls were found in the full forward position. The two cockpit seats were crushed and displaced to the right. The seats contained shoulder harness and lap belt restraints which were cut by rescue personnel. The rear seats, which faced aft, were intact and the lap belt restraints were found stowed. An Apple iPad1 was found between the left front seat and the left fuselage side wall. There were no paper instrument approach plates located in the airplane.

The empennage remained attached to the fuselage. The right stabilizer was bent upward at midspan. The elevator trim was found in the neutral position.

Flight control continuity was established from all flight control surfaces to the cockpit.

The engine remained partially attached to the firewall, and the firewall was separated from the fuselage. The propeller hub was separated from the engine crankshaft. The engine crankshaft was rotated by hand and mechanical continuity was noted throughout the engine, with the exception of the number 6 exhaust valve and rocker arm. The number 6 exhaust valve push rod was found damaged consistent with the impact. The magnetos were removed and rotated by hand. Sparks were noted on all ignition leads.

The three propeller blades remained attached to the hub. The blades exhibited leading edge damage and chordwise scratching. Two blade tips were missing and not located. The remaining portions of the blades were twisted and bent aft.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy on the pilot was performed by Spectrum Health, Grand Rapids, Michigan. The autopsy report listed the cause of death as blunt force injuries to the head and chest.

Forensic toxicology was performed on specimens of the pilot by the FAA Civil Aerospace Medical Institute (CAMI), Oklahoma City, Oklahoma. The toxicology report was negative for carbon monoxide, cyanide, ethanol, and drugs.

TESTS AND RESEARCH

The NTSB Vehicle Recorder Division examined the following non-volatile memory (NVM) devices that were recovered from the airplane: Apple iPad1, Garmin TAWS/Terrain Data Card, Jeppesen IFR Data Card, and a Jeppesen IFRW Data Card.

Examination of the Apple iPad revealed the exterior of the unit had sustained significant impact damage. The internal processor printed circuit board (PCB) appeared undamaged and was transferred to a surrogate iPad for data recovery. The iPad appeared to have a functional copy of the ForeFlight App installed. The ForeFlight App contained reference to an approach plate for the RNAV (GPS) Runway 27 procedure to CVX. The approach plate was designated and dated EC-1, 02 JUN 2011 to 30 JUN 2011. The iPad recorded last being connected to via WiFi on June 24th. Examination of the cache information indicated that the com.apple.AppStore had been launched 6 times on the day of the accident. The last CFURL_CACHE_RESPONSE (found in Cache.db for com.apple.mobilesafari) was on June 24, 2011, at 20:46:34 to the following URL: www.weather.com/common/a21/makerequest-

2_3.html?pos=wx_tile1&key=1308890399090. No other recognizable aviation-related data was recovered from the iPad.

Examination of the data cards revealed little or no damage. In order to determine the effective dates for the mapping data stored on each card, the NVM chips were removed and read using a memory programmer. The following copyright statements were recovered from the cards:

Garmin TAWS/Terrain Card

1. Worldwide Detail Landmap Copyright 1995-2005 by Garmin Corp.
2. Copyright 2007 Garmin Ltd. US/Europe Obstacles
3. Copyright 2006 Garmin Ltd. Worldwide Airport Terrain
4. Copyright 2006 Garmin Ltd. Worldwide 30AS Terrain

Jeppesen IFR Card

1. Copyright 2009-2010 Garmin Corp.
2. Copyright 2009-2010 Jeppesen Sanderson Inc.

Jeppesen IFRW Card

1. Copyright 2011 Jeppesen Sanderson Inc.

History of Flight

Maneuvering-low-alt flying	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	Age:	46, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
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:	05/25/2010
Occupational Pilot:	No	Last Flight Review or Equivalent:	06/25/2010
Flight Time:	(Estimated) 1300 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BEECH	Registration:	N88MN
Model/Series:	A36	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	E-741
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	12/12/2010, Annual	Certified Max Gross Wt.:	3600 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	5514 Hours as of last inspection	Engine Manufacturer:	CONT MOTOR
ELT:	C91 installed, activated, did not aid in locating accident	Engine Model/Series:	IO-520-BB mod
Registered Owner:	MICROJET LLC	Rated Power:	285 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Day
Observation Facility, Elevation:	CVX, 669 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	1935 EDT	Direction from Accident Site:	180°
Lowest Cloud Condition:		Visibility	2 Miles
Lowest Ceiling:	Overcast / 200 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	9 knots / 15 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	260°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.72 inches Hg	Temperature/Dew Point:	11° C / 11° C
Precipitation and Obscuration:			
Departure Point:	Fort Wayne, IN (SMD)	Type of Flight Plan Filed:	IFR
Destination:	Charlevoix, MI (CVX)	Type of Clearance:	IFR
Departure Time:	1730 EDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	1 Fatal, 1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal, 1 Serious	Latitude, Longitude:	45.304722, -85.275278 (est)

Administrative Information

Investigator In Charge (IIC):	Aaron M Sauer	Report Date:	04/20/2012
Additional Participating Persons:	Kenneth J Hughes; Federal Aviation Administration; Grand Rapids, MI Paul E Yoos; Hawker Beechcraft Corporation; Wichita, KS Rodney Martinez; Continental Motors Inc; Mobile, AL		
Publish Date:	04/20/2012		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=80888		

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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](#).