



# Aviation Investigation Final Report

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<b>Location:</b>	Bear Branch, Kentucky	<b>Accident Number:</b>	ERA10FA246
<b>Date &amp; Time:</b>	April 27, 2010, 12:26 Local	<b>Registration:</b>	N1856S
<b>Aircraft:</b>	Beech 58	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

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## Analysis

The pilot was on an instrument flight rules flight plan, and was en route to his destination, when he contacted air traffic control and requested a lower altitude because the airplane was losing airspeed. The pilot was instructed to descent to 7,000 feet. The pilot acknowledged the clearance and requested a lower altitude because he was still losing airspeed. The last altitude that the pilot was issued was 5,000 feet. The airplane was last observed by radar at 5,000 feet and there were no further communication between him and the controller.

A witness stated that he heard an airplane flying overhead and the engines were surging. He described the weather as extremely low clouds, mist and rain.

AIRMET Zulu was current for the area for moderate icing conditions from approximately 5,000 to 16,000 feet mean sea level. The pilot obtained a preflight weather briefing which included the AIRMET. The base reflectivity image with the overlaid flight track of the accident airplane indicated that the flight was maneuvering in echoes that indicated favorable conditions for icing during the flight. The airplane was approved for flight into known icing conditions because it was equipped with de-icing systems. The airplane was also equipped with an onboard weather radar system; however, it is unknown if the weather radar equipment was operating at the time of the accident.

A postaccident examination of the wreckage revealed no preimpact anomalies with the engine, airframe or systems that would have precluded normal operation. It is probable that the airplane may have accumulated ice on its surfaces and the pilot was unable to maintain an

adequate airspeed during the descent.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper in-flight planning/decision, his continued flight into adverse weather (icing conditions), and failure to maintain an adequate airspeed during the emergency descent.

### Findings

<b>Environmental issues</b>	Conducive to structural icing - Contributed to outcome
<b>Personnel issues</b>	Decision making/judgment - Pilot
<b>Aircraft</b>	(general) - Attain/maintain not possible

## Factual Information

### History of Flight

<b>Enroute-cruise</b>	Other weather encounter
<b>Enroute-descent</b>	Loss of control in flight (Defining event)
<b>Uncontrolled descent</b>	Collision with terr/obj (non-CFIT)

### HISTORY OF FLIGHT

On April 27, 2010, about 1226 eastern daylight time, a Beech 58, N1856S, registered to the Island Trading LTD and operated by an individual, crashed in the Daniel Boone National Forest near Bear Branch, Kentucky, during an instrument flight rules (IFR) flight from the Frederick Municipal Airport (FDK), Frederick, Maryland to the Olive Branch Airport (OLV), Olive Branch, Mississippi. Instrument meteorological conditions prevailed at the time and an IFR flight plan was filed for the Title 14 Code of Federal Regulations Part 91 personal flight. The airplane incurred substantial damage and the pilot/owner and passenger were killed.

The pilot was in communication and in radar contact with the Federal Aviation Administration (FAA), Indianapolis Air Traffic Control Center (ZID) at the time of the accident. The pilot requested a higher altitude deviation due to weather conditions. The airplane climbed and was observed at 12,000 feet (ft) means sea level (msl). About 10 minutes later, the pilot reported problems with the airplane's airspeed indicator and requested a lower altitude. The pilot continued reporting airspeed problems during his descent. The last communication from the pilot was "just went down like an absolute rock ---don't know what happened". At 1225 EDT the airplane was lost from the ZID radar; the last radar contact showed the airplane around 5,000 ft msl. The Civil Air Patrol was notified of a possible downed airplane and a search was initiated. About 1730 local residents notified law enforcement that they located a crashed airplane on a hill side. At 1930 the search crew was able to reach the wreckage in the dense forest.

Witnesses who reside at the bottom of the hill where the airplane crashed stated that about the time of the accident they heard an airplane flying overhead. The airplane was flying south and then they heard it flying north; all the meanwhile the engines were surging slowly. As the airplane flew behind their house over the hill, a loud noise similar to a big tree falling was heard. The sound of the engines stopped at that moment. At the time of the accident the witnesses reported the weather conditions were extremely low clouds, mist, and rain.

### PERSONNEL INFORMATION

The pilot, age 68, seated in the left front seat, held a FAA commercial pilot certificate with ratings for airplane single engine land, multiengine airplane land, and instrument airplane. He was issued a third-class medical certificate on November 25, 2009, with limitation of must

have available glasses for near vision and not valid for any class after. A review of the pilot's flight logbook, dating from May 2008 to the date of the accident, revealed that the pilot had a total of 1,545 total hours, which 104 hours in the accident airplane, and he documented 14 hours of instrument time.

The passenger, seated in the right front seat, held no FAA certificates.

#### AIRCRAFT INFORMATION

The Beech 58, Baron, a six place, all metal low wing, twin-engine airplane, variable-pitch propeller, with retractable landing gear, serial number TH-1300, was manufactured in 1981, and issued a standard airworthiness certificate, in the normal category. The airplane was powered by two each Continental IO-520-CB, 285-horsepower engine and equipped with Hartzell, three bladed, propellers. The airplane was equipped, from the manufacturer, with windshield and propeller anti-ice alcohol systems. The airplane was equipped with a supplemental type certificate de-ice boot system on the leading edge of the wings, horizontal and vertical stabilizers. The airplane was equipped with an onboard weather radar system. The airplane was under the annual maintenance inspection program. The last annual inspection was performed on May 14, 2009, which the airplane had a total time of 5,840 hours.

#### METEOROLOGICAL INFORMATION

The closest official weather observation was at the Julian Carroll Airport (JKL), Jackson, Kentucky, 30 miles north of the accident site. The JKL 1153 METAR, was winds variable at 5 knots; visibility 5 statute miles; light rain and mist, scattered clouds at 800 agl; overcast at 3,600 agl, temperature 9 degrees Celsius (C); dew point 7 degrees C; altimeter 29.64 inches of mercury.

The National Weather Service (NWS) Surface Analysis Chart depicted a cold front along the route of flight with an extensive area of clouds and precipitation. The NWS Weather Depiction Chart depicted IFR to meteorological visual flight rules (MVFR) conditions over the route and the accident site during the period with rain showers and low ceilings. The NWS Radar Summary Chart and regional radar mosaic depicted the accident site in an area of echoes of 35 to 45 dBZ. The JKL reported IFR to MVFR ceilings and visibility surrounding the hour prior to the accident. At the time of the accident the airport reported light wind, visibility 5 miles in light continuous rain and mist, with scattered clouds at 800 feet, ceiling overcast at 3,600 feet. The NWS Nashville (KBNA) 0800 EDT sounding depicted favorable conditions for IFR conditions with low ceilings with expected cloud tops to 22,000 feet. The freezing level was identified at 6,000 feet and the sounding supported icing conditions in clouds and precipitation. The probability of icing was greatest between 9,000 and 11,000 feet, with over 80 percent probability of light to moderate mixed icing. NWS Jackson (KJKL) weather service radar (WSR)-88D depicted a band of echoes over the route of flight and the accident site with reflectivities in the range of 20 to 35 dBZ. The higher elevation scans depicted a bright banding

signature, which was likely associated with wet snow near the freezing level producing an artificial high reflectivity value. The base reflectivity image with the overlaid flight track of accident airplane indicated that the flight was in echoes from 1150 through 1226 EDT that indicated favorable conditions for icing during the flight. The Geostationary Operations Environmental Satellite (GOES) -13 satellite imagery depicted an extensive band of enhanced cloud tops associated with nimbostratus type clouds over the area with radiative cloud top temperature of 234.80° K or -38.36° C at 1232 EDT, which corresponded to cloud tops near 27,500 feet. The GOES-13 visible imagery depicted an overcast layer of nimbostratus clouds over the route and accident site when the pilot reported encountering icing conditions, with the band ending approximately 20 miles south and becoming more broken to scattered cloud cover over Tennessee. Numerous pilot reports indicated light to moderate rime to mixed icing conditions from 5,000 to 15,000 feet over the area. The NWS had AIRMET Zulu current for the area for moderate icing conditions from approximately 5,000 to 16,000 feet. The pilot obtained a preflight weather briefing which included the AIRMET for moderate icing conditions along the route of flight.

## WRECKAGE AND IMPACT INFORMATION

The airplane wreckage was located at 37 degrees 11.490 minutes north latitude and 83 degrees 30.753 minutes west longitude. The wreckage was contained within the impact area. The airplane came to rest on a heading of 176 degrees. The airplane came in contact with 30 degrees sloped terrain, consisted of rock and clay, in an approximately 30 degrees nose low attitude. The impact site consisted of dense forest with tall trees and large bushes. There was no smell of fuel reported by the first on scene personnel. However, observation of the vegetation near the wreckage was consistent with being exposed to aviation fuel. A few tree branches, directly overhead of the wreckage, were observed with contact damage. The vegetation surrounding the wreckage was observed undisturbed.

All of the airplanes flight control surfaces were located among the wreckage. The forward section of the fuselage up to the front cabin area was crushed aft to the mid section of the cabin. Both engines were still attached to the airframe and in 3 feet deep craters. Both wing leading edges were crushed aft. The mid cabin and empennage section were bent over and came to rest over the forward cabin and wing section. The rotating beacon red lens on top of the vertical stabilizer was fractured and found in front of the main wreckage. The flaps were observed in the up position and the landing gear was observed in the retracted position.

The left engine's propeller assembly was attached to the engine crankshaft flange. Two of the three propeller blades were separated from the base of the hub. One of the separated blades was not recovered. The remaining blades were bent aft conforming to the crater. The fracture surface of the separated and missing blade was consistent with overload. The right engine's propeller assembly was separated aft of the crankshaft flange. The fractured surface on the crankshaft was consistent with torsional overload. All three blades were attached to the hub and bent aft conforming to the crater. Both wing fuel tanks were breached. Sections of left and right wing leading edge de-ice boots were observed inflated. The vertical stabilizer leading

edge boots were observed with partial inflation.

The responding FAA Inspector stated the emergency locator transponder (ELT) did not aid in locating the wreckage. However, the FAA inspector switched the ELT to the armed mode and the ELT activated.

A post recovery wreckage examination was performed by the engine, airframe, and propeller manufacturer with National Transportation Safety Board oversight. Evidence of fuel was observed in the airframe's fuel system. The left and right fuel selector valves were observed in between the off and on position. Flight control continuity was established and all separations were consistent with overstress separation or from the recovery process. Engine control lever continuity was established. Evidence of fuel was observed in both engine's fuel system. Continuity and cylinder compression was established with both engines. The vacuum pump and de-ice system pump were observed and were unremarkable. The left engine's right magneto would not spark when rotated by hand. Both propellers were not feathered, and at a low pitch with rotation at low to no power at the time of impact. The instrument panel was destroyed; fractured in several pieces. The attitude indicator gyro was removed and there was rotational scoring on the brass face and aluminum housing. No other discernable information was gathered from the instruments.

#### MEDICAL AND PATHOLOGICAL INFORMATION

The Commonwealth of Kentucky Chief Medical Examiner's Office in Frankfort, Kentucky, conducted a postmortem examination. The cause of death for the pilot and passenger was blunt force trauma.

The FAA Civil Aeromedical Institute (CAMI) conducted toxicology testing on specimens from the pilot and passenger. No ethanol was detected in the pilot; chlorpheniramine, diphenhydramine, irbesartan, metoprolol, and naproxen was detected, and putrefaction was noted. No ethanol was detected in the passenger's and no putrefaction was noted.

The pilot had previously noted the use of metoprolol, irbesartan, and naproxen, as well as a history of "Hay fever or allergy" and the use of loratadine on applications for FAA airman medical certificate, but had not noted the use of chlorpheniramine or diphenhydramine.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	68, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<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>	November 25, 2009
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	1545 hours (Total, all aircraft), 104 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Beech	<b>Registration:</b>	N1856S
<b>Model/Series:</b>	58	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	TH-1300
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	May 14, 2009 Annual	<b>Certified Max Gross Wt.:</b>	5400 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	5840 Hrs as of last inspection	<b>Engine Manufacturer:</b>	CONT MOTOR
<b>ELT:</b>	C91A installed, not activated	<b>Engine Model/Series:</b>	IO 520 SERIES
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	285 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Instrument (IMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	JKL,1381 ft msl	<b>Distance from Accident Site:</b>	30 Nautical Miles
<b>Observation Time:</b>	11:53 Local	<b>Direction from Accident Site:</b>	21°
<b>Lowest Cloud Condition:</b>	Scattered / 800 ft AGL	<b>Visibility</b>	5 miles
<b>Lowest Ceiling:</b>	Overcast / 3600 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	5 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.63 inches Hg	<b>Temperature/Dew Point:</b>	9°C / 7°C
<b>Precipitation and Obscuration:</b>	Light - Showers - Mist		
<b>Departure Point:</b>	Frederick, MD (FDK)	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Olive Branch, MS (OLV)	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	10:24 Local	<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	37.191387,-83.512496



## Administrative Information

<b>Investigator In Charge (IIC):</b>	Obregon, Jose
<b>Additional Participating Persons:</b>	John W Cox; FAA/FSDO; Louisville, KY Shannon Bengeyfield; FAA/FSDO; Louisville, KY Timothy Rainey; Hawker Beechcraft Corporation; Wichita, KS Sara Irwin; Teledyne Continental Motors, Inc; Mobile, AL Tom McCreary; Hartzell Propeller Inc.; Piqua, OH
<b>Original Publish Date:</b>	August 30, 2011
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB traveled to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=75870">https://data.nts.gov/Docket?ProjectID=75870</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).