# Aviation Investigation Final Report

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| **Location:** | Topeka, Kansas | **Accident Number:** | CEN11FA302 |
| **Date & Time:** | April 22, 2011, 12:13 Local | **Registration:** | N580EA |
| **Aircraft:** | Beech 58 | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | Loss of control in flight | **Injuries:** | 4 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The pilot was cleared for a localizer approach to the airport in instrument conditions. However, the pilot overshot the final approach course and decided to perform a missed approach. While climbing during the missed approach, the pilot requested and was cleared to fly a global positioning satellite (GPS) approach to the airport. The pilot was maneuvering in instrument meteorological conditions (IMC) to set up for the GPS approach when the airplane departed controlled flight and impacted terrain. The airplane fragmented and a postcrash fire ensued. Crush angles on fragmented pieces of the airplane indicated the airplane struck the ground in a left descending turn at high speed. Radar data showed the airplane maneuvering north-northeast of the airport in a left descending turn before it disappeared from radar. The weather conditions at the airport at the time of the accident were reported as a 500-foot overcast ceiling and 10 miles visibility. According to the pilot's records, in the 5 months since he received his instrument rating, he had logged 0.7 hours of instrument time. His total time logged as flying in actual instrument conditions was 11 hours. Additionally, the pilot received his multiengine airplane rating 2 months before the accident and had logged 28.7 total hours of multiengine airplane flight time. It is likely that that the pilot became disoriented while maneuvering in IMC to set up for the GPS approach and lost control of the airplane.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot failed to maintain control of the airplane while maneuvering in instrument meteorological conditions. Contributing to the accident was the pilot's minimal experience flying in actual instrument conditions.

## Findings

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| **Aircraft** | Directional control - Not attained/maintained |
| **Personnel issues** | Total experience - Pilot |
| **Environmental issues** | Approach control procedure - Effect on operation |
| **Environmental issues** | (general) - Effect on operation |

# Factual Information

## History of Flight

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| **Approach-IFR missed approach** | Loss of control in flight (Defining event) |

HISTORY OF FLIGHT

On April 22 2011, about 1213 central daylight time, a Beech 58, N580EA, registered to a limited liability corporation and operated by a private individual collided with the ground while executing a missed approach at the Phillip Billard Municipal Airport (TOP) Topeka, Kansas. The certificated private pilot and three passengers on board the airplane were fatally injured. The airplane was substantially damaged by ground impact and a post-crash fire. The airplane was operating on an instrument flight rules flight plan under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Instrument meteorological conditions prevailed for the cross-country flight that originated at the Scott City Municipal Airport (TQK), Scott City, Kansas, about 1045, and which was en route to TOP.

At 1146, the pilot checked in with Kansas City Air Route Traffic Control Center (ARTCC). The center controller cleared the airplane to descend to 5,000 feet [msl – mean sea level]. The pilot then asked the controller what runway they were landing on at TOP. The controller responded with runway 31 and that TOP was broadcasting for the back course localizer approach. The controller then asked if the pilot would like vectors to the approach. The pilot said that he would.

At 1156:56, the ARTCC controller contacted TOP Air Traffic Control Tower (ATCT) and informed them that N580EA would be four miles south of UJASA, a radar-established intersection on the final approach course for the approach, in four minutes.

At 1200:05, the ARTCC controller informed the pilot that he was six miles south of UJASA and to fly a heading of three-four-zero to intercept the inbound radial for the approach. The pilot acknowledged the heading. At 1200:28, the controller cleared the pilot for the approach.

At 1202:35, the ARTCC controller informed the pilot that he flew through the radial and asked if the pilot showed himself establishing on the inbound course? The pilot responded, “I’m working it …” The controller then gave the pilot another heading to intercept the radial. The pilot responded acknowledging the heading.

At 1205:40, the controller contacted TOP ATCT and informed them that the airplane had flown through the radial and was six miles south of the airport. The ATCT controller acknowledged.

At 1205:57, the ARTCC controller informed the pilot that he was still cleared for the approach,

that radar service was terminated, and to contact TOP ATCT.

At 1208:05, the pilot told the tower that he was going missed approach and then requested if he could circle to land. TOP ATCT responded directing the pilot to fly runway heading and telling him that they would get with center for climb out instructions. The pilot then said he could do the GPS (Global Positioning Satellite receiver) approach for runway 36. TOP ATCT instructed the pilot to execute the published missed approach and climb and maintain 4,000 feet. The pilot acknowledged and read back the instructions. The tower controller then called ARTCC and informed them of the pilot's intentions.

A tower controller reported seeing the airplane break out of the clouds. The airplane was at approximately 1,000 feet past the approach end of runway 31 and "well left of runway 31 and taxiway Charlie". After he heard the pilot make his request to circle, the tower controller saw the airplane reenter the clouds.

Two pilot witnesses at TOP reported observing the accident airplane flying in a level flight attitude about halfway down runway 31. The airplane's landing gear was extended and the witnesses estimated the airplane's altitude as being about 200 to 300 feet above the runway. When the airplane was near the runway's end, they witnesses observed the landing gear retract and the airplane begin a slow climb into the clouds. The witnesses estimated the overcast ceiling to be at 500 feet above ground level (agl) and the visibility to be 2.5 miles.

At 1209:15, TOP ATCT instructed the pilot to contact Kansas City ARTCC. The pilot replied with reading back the frequency.

At 1209:22, the pilot contacted ARTCC and informed them he was on the missed approach. The center controller instructed the pilot on leaving 3,000 feet msl to make a right turn and fly direct to the WUPLA intersection for the GPS approach to runway 31.

At 1211:32, the ARTCC controller told the pilot to maintain 3,600 [feet] until established on the approach and that he was cleared for the GPS approach to runway 31 at TOP. The pilot acknowledged and read back the altitude. That was the last transmission received from the airplane. The controller then said, "and November zero echo alpha, when you … executed the back course [you] were just too high to … execute the … correction to … land."

At 1212:31, the ARTCC controller tried to contact N580EA. At 1212:45, the controller tried again with instructions to climb and maintain 3,600 [feet].

At 1212:58, the controller broadcasted to the pilot, "November zero echo alpha radar contact lost say altitude.

Radar data showed the airplane over the airport at 1208:48 at an altitude of 1,500 feet msl. The data showed the airplane make a turn to the east and then southeast leveling off at 3,400 feet msl. The airplane then made a left 180-degree turn back toward the west. At 1211:42, the

airplane was shown turning to the southeast and had descended to 3,300 feet msl. At 1211:48, the airplane suddenly disappeared from radar.

Several people in the vicinity of the accident site reported hearing the airplane fly overhead. They all reported hearing the ground impact and seeing a fireball; however, none of the witnesses reported seeing the airplane impact the ground.

## PERSONNEL INFORMATION

The pilot in the left seat, age 35, held a private pilot certificate with a single engine and multi-engine land airplane and instrument airplane ratings. According to his logbook, the pilot had 438 total flying hours. Of that total time, 28.7 hours of the time was in multi-engine airplanes and 17.5 hours was in the Beech 58. The logbook also showed the pilot as having flown 30.1 hours within the preceding 90 days, 20.1 hour within the preceding 60 days and 8.7 hours in the previous 30 days.

Regarding the pilot's instrument time, his logbook showed him having 50 hours of simulated instrument time and 11 hours in actual instrument conditions. However, since passing his initial instrument proficiency check on November 10, 2010, to the time of the accident, the pilot had logged 0.7 hours.

The pilot successfully completed a check flight for a multi-engine airplane rating on February 18, 2011.

According to insurance records, the pilot held a Third Class medical certificate dated February, 2010.

## AIRCRAFT INFORMATION

The airplane was a 1973 Beech Model 58C, serial number TH-316. The airplane was powered by two Teledyne Continental Motors IO-520-CB engines; each rated at 285 horsepower.

According to the airplane logbook, the airplane underwent a 100 hour inspection on October 1, 2010. The recorded Hobbs meter reading at the time of the 100 hour inspection was 4,624.1 hours. A final logbook entry dated April 11, 2011, where a bracket air filter was installed, showed a tachometer time of 4,743.3 hours

## METEOROLOGICAL INFORMATION

At 1153, the aviation routine weather report (METAR) for the Phillip Billard Municipal Airport (KTOP), four miles southwest of the accident site was wind 010 degrees magnetic at 9 knots, visibility 10 statute miles, ceiling 500 feet overcast, temperature 55 degrees Fahrenheit (F), dew point 53 degrees F, altimeter 29.64 inches of Mercury (HG) and remarks: Variable ceiling height 400 to 800 feet.

At 1253, KTOP reported wind 340 degrees magnetic at 5 knots, visibility 6 statute miles with light rain, ceiling 700 feet overcast, temperature 55 degrees F, dew point 53 degrees F, altimeter 29.65 inches HG, and remarks: Rain began at 1203 and ended at 1239, variable ceiling height 400 to 900 feet.

## WRECKAGE AND IMPACT INFORMATION

The airplane impacted in a down sloping, fallowed cornfield, about four miles northeast of TOP. The main impact crater was at 39 degrees, 07.39 minutes north latitude and 095 degrees 25.281 minutes west longitude. The elevation at the accident scene was 1,012 feet msl. The accident site extended north-northeast along a 030 degree magnetic heading for about 372 feet. The crash site was approximately 100 feet wide as defined by the debris field.

The accident site began with a 21-foot long, 8-foot wide and 5-foot deep impact crater. The crater contained both engines, both propellers, and one main and the nose landing gears. Both engines had broken free of the engine mounts and nacelles. The right propeller was separated from its engine and rested nearby. The three blades showed varying degrees of chordwise scratches and leading edge gougings. All three blades showed torsional bending. The left engine was also broken out from the nacelle. The left propeller was broken and found underneath the engine. Two of its blades showed torsional bending. One blade had broken out at the hub. Measured crushing on the engines, and wing and nacelle fragments were consistent with the airplane impacting the terrain in a 25 degree nose low, 40 to 45 degree left wing low flight attitude.

The empennage section and fuselage aft of the baggage compartment was located 81 feet north-northeast of the impact crater along the 030 degree wreckage path. The fuselage was bent and broken. The vertical stabilizer, rudder, horizontal stabilizers and elevators were bent and broken. Flight control continuity to the ruder and elevators was confirmed.

Beyond the fuselage to the end of the accident site was a debris field that contained the fragmented components of the airplane's cabin, wings, and forward fuselage. Many of the fractured pieces were charred, melted, and consumed by the post-impact fire. A large section of the right wing was located about 30 feet beyond the empennage section. Also within this area were broken engine components, flight and engine instruments, and personal effects.

The airplane wreckage was retained for further examination.

## MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at the Shawnee County Morgue, Topeka, Kansas, on April 23, 2011

Results of toxicology testing of samples taken from the pilot were negative for all tests

conducted.

TESTS AND RESEARCH

The airplane's engines were examined at Topeka, Kansas, on April 24, 2011. The examination of the engines did not reveal any abnormalities that would have prevented their normal operation and production of rated horsepower. The examination of the other airplane systems did not reveal any preimpact anomalies.

A Garmin model 696 was recovered from the wreckage and sent to the National Transportation Safety Board Vehicle Recorders Laboratory on April 29, 2011 for examination and data retrieval. On examination of the unit, it was revealed that the non-volatile memory chip was ejected. No information was gleaned from the unit.

A review of the air traffic control (ATC) services provided the pilot by the Kansas City ARTCC showed the controller issued incorrectly phrased instructions to the pilot when the controller transmitted “N580EA is 6 miles south of UJASA, fly heading 340, intercept the Topeka 129 radial for the back course runway 31 approach.” The pilot responded that he’d intercept the Topeka 129 for the back course for runway 31. The 30-degree intercept angle met the proper approach course intercept standards cited in FAA Order 7110.65, “Air Traffic Control”, but the “129 radial” phraseology used is more typically used as part of an ATC instruction related to VORs (Very High-Frequency Omnirange navigation aid). The Topeka (TOP) VOR was located 5 miles northeast of TOP (Billard) airport. The TOP VOR 129 radial was parallel to the localizer back course, but 5.5 nautical miles northeast of it. The TOP VOR and the TOP 129 radial were not used to define the final approach portion of the localizer back course 31 procedure, but the VOR is used as part of the missed approach procedure. Radar data showed that on the pilot accepting the approach clearance, the airplane continued on the 340-degree heading across the localizer back course. The airplane then turned to approximately 309 degrees, the inbound heading for the back course localizer procedure on reaching the vicinity of the TOP VOR 129 radial and well north of the final approach course for the localizer. At that time, the controller noted the pilot’s apparent deviation from the localizer procedure and instructed the pilot to fly a heading of 280 degrees “to intercept the 129 radial for the back course.” The heading took the airplane back to the correct final approach course. The pilot intercepted correct course at POACH, the final approach fix for the approach located 3.9 nautical miles from the runway. The airplane at that time was at 2,900 feet msl. The published crossing altitude at POACH was 2,200 feet. The pilot executed the missed approach shortly afterward.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 35,Male |
| **Airplane Rating(s):** | Single-engine land; Multi-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 3 Without waivers/limitations | **Last FAA Medical Exam:** | February 28, 2010 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | February 18, 2011 |
| **Flight Time:** | 438 hours (Total, all aircraft), 18 hours (Total, this make and model), 398 hours (Pilot In Command, all aircraft), 30 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Beech | **Registration:** | N580EA |
| **Model/Series:** | 58 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | TH-316 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 6 |
| **Date/Type of Last Inspection:** | October 1, 2010 100 hour | **Certified Max Gross Wt.:** | |
| **Time Since Last Inspection:** | | **Engines:** | 2 Reciprocating |
| **Airframe Total Time:** | 4624.2 Hrs as of last inspection | **Engine Manufacturer:** | CONT MOTOR |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | IO 520 SERIES |
| **Registered Owner:** | PRECISION AG & SEED SERVICES LLC | **Rated Power:** | 285 Horsepower |
| **Operator:** | PRECISION AG & SEED SERVICES LLC | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Instrument (IMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | TOP,881 ft msl | **Distance from Accident Site:** | 4 Nautical Miles |
| **Observation Time:** | 12:19 Local | **Direction from Accident Site:** | 210° |
| **Lowest Cloud Condition:** | | **Visibility** | 2.5 miles |
| **Lowest Ceiling:** | Overcast / 500 ft AGL | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 7 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 340° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29.65 inches Hg | **Temperature/Dew Point:** | 12°C / 12°C |
| **Precipitation and Obscuration:** | N/A - None - Mist | | |
| **Departure Point:** | Scott City, KS (TQK ) | **Type of Flight Plan Filed:** | IFR |
| **Destination:** | Topeka, KS (TOP ) | **Type of Clearance:** | IFR |
| **Departure Time:** | 10:45 Local | **Type of Airspace:** | |

## Airport Information

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| **Airport:** | Philip Billard Municipal TOP | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 881 ft msl | **Runway Surface Condition:** | Unknown |
| **Runway Used:** | 31 | **IFR Approach:** | LOC-backcourse |
| **Runway Length/Width:** | 5099 ft / 100 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | 3 Fatal | **Aircraft Fire:** | On-ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 4 Fatal | **Latitude, Longitude:** | 39.123054,-95.588058 |

## Administrative Information

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| **Investigator In Charge (IIC):** | LeBaron, Timothy |
| **Additional Participating Persons:** | Mike Baker; Federal Aviation Administration; Wichita, KS<br>Ernest Hall; Hawker Beechcraft; Wichita, KS<br>Rodney Martinez; Continental Motors, Inc; Mobile, AL<br>Bruce Lampert; National Association of Air Traffic Controllers; Longmont, CO |
| **Original Publish Date:** | December 5, 2012 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=78943 |