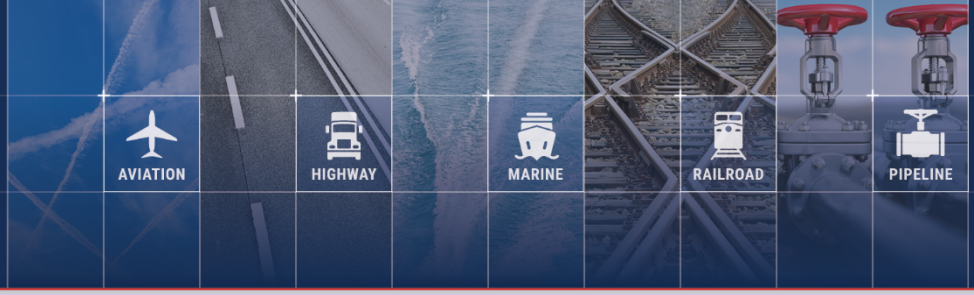

Aviation Investigation Final Report

Location:	Hamilton, Georgia	**Accident Number:**	ATL07FA077
Date & Time:	April 22, 2007, 14:51 Local	**Registration:**	N5647C
Aircraft:	Beech 58	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	5 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The accident pilot had recently returned from an airshow, and had shared with his pilot associates that he thought he could roll his personal airplane. He had previously attempted to roll the airplane, but a pilot-rated passenger stopped the accident pilot from completing the aerobatic roll. On the accident flight, a ground witness, who is also a pilot, heard the accident airplane, and thought it sounded like the pilot was doing aerobatic maneuvers. He heard the engine noise continue to increase, and saw the airplane descending very fast, in a 45 to 60 degree nose down attitude. The witness then saw a portion of the airplane break away prior to impact. Postaccident inspection of the airplane by the NTSB investigator-in-charge and the NTSB Materials Laboratory, disclosed evidence of pilot-induced overload failures of the tail and wings. The accident pilot's airplane was not designed or approved for aerobatic flight.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's exceeding the design stress limits of the airplane while performing aerobatics in a nonaerobatic airplane, which resulted in an in-flight overload failure of the airframe. A factor in the accident was the pilot's decision to perform aerobatics.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: MANEUVERING

Findings
1. (C) DESIGN STRESS LIMITS OF AIRCRAFT - EXCEEDED - PILOT IN COMMAND
2. (F) AEROBATICS - PERFORMED - PILOT IN COMMAND
3. AIRFRAME - OVERLOAD

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On April 22, 2007, about 1451 eastern daylight time, a Beech BE-58, N5647C, registered to Renaissance Aircraft Management LLC, operating as a 14 CFR Part 91 personal flight, broke up in flight in the vicinity of Hamilton, Georgia. Visual meteorological conditions prevailed and no flight plan was filed. The airplane was destroyed. The private pilot and 4 passengers were fatally injured. The flight originated from Jack Edwards Airport, Gulf Shores, Alabama, at about 1345 central daylight time.

A witness stated he was in his boat fishing in a lake in the vicinity of his home. He heard an airplane approaching his location from the southeast to the northwest. It sounded as if the pilot was performing some acrobatic maneuvers. The witness looked up and could not see the airplane. The engine noise continued to increase in intensity and the witness observed the airplane to the north of the lake heading northwest. The airplane was high and descending very fast in a 45 to 60 degree nose down attitude. The witness stated he observed a wing or part of the tail separate from the airplane in the vicinity of Hamilton Mulberry Grove Road. He immediately went to his boat dock and to his home and called the 911 emergency operators to report the accident.

A motorist approached a Georgia State Patrol Officer at the accident scene and informed the Officer that he was a friend of the deceased pilot. He further informed the officer that he was planning on purchasing an airplane from the pilot, and the pilot was going to use the money from the sale of the airplane to purchase the Beech 58 that he was flying at the time of the accident. The motorist further stated that the accident pilot's "flying skills were below his standards because the pilot was known for overstressing the planes he flew." The motorist, having flown with the accident pilot previously, also indicated that he made a statement to a friend about three weeks ago that the accident pilot would probably crash an airplane within the next year.

A friend of the pilot stated the pilot was in his shop on Friday, April 20, 2007, before he departed to Gulf Shores, Alabama on a fishing trip in his Beech 58. The friend informed the pilot, "That he thought he was stupid and not to do anything in the airplane that would get him hurt." The pilot stated, "I think I can roll this airplane." The friend stated, "The pilot had been at Sun N' Fun in Lakeland, Florida, during the week and had observed a performer rolling a Beech 18, and the deceased pilot just kept the rolling issue in his head." The friend stated the accident pilot had flown with a retired airline pilot who owns a Beech 55, and the retired airline pilot had rolled the airplane with the deceased pilot as a passenger.
Another friend of the deceased pilot stated he was in the right front seat of the airplane on April 19, 2007, on a return flight from Sun N' Fun in Lakeland, Florida, with two other

passengers in the back seats. They departed Lakeland, Florida, and the pilot climbed to an initial cruising altitude of 9,500 feet. The autopilot was on and the airplane was cruising at 220 knots. The pilot climbed to 10,500 feet to see if they could get a better ground speed and eventually descended back down to 9,500 feet. A short time later, the pilot stated, "I want to try something." The pilot rolled the airplane to the left side, and then back to the right side with the autopilot off and stated, "I believe it's possible to roll this airplane."

The friend stated that the pilot pushed down on the control yoke, initiated a descent, and turned the airplane to the left, pulled back on the control yoke, and the airplane went up and over to the right like a spiral until the airplane was in a knife-edge attitude. The friend of the pilot stated he did not know what airspeed they obtained while the pilot was performing this maneuver and stated, "It got me out of my comfort zone, and I could not handle it." The friend stated he grabbed the flight controls, leveled the airplane, and stated to the pilot, "I can not do this." The pilot replied, "I believe it is possible to roll this airplane." The pilot then descended down to 7,500 feet and leveled off in cruise flight, and there was no further discussion about rolling the airplane. A short time later, the pilot pulled the power back on the right engine, feathered the propeller, and they continued towards Griffin, Georgia, in cruise flight. The pilot later started the engine, and they made their decent and landing at Griffin.

PERSONNEL INFORMATION

Review of information on file with the FAA Airman's Certification Division, Oklahoma City, Oklahoma, revealed the pilot was issued a private pilot certificate March 29, 2007, with ratings for airplane single engine land, multiengine land, and instrument airplane. The pilot's last flight review was on March 29, 2007, when he received his private pilot airplane multiengine rating. The pilot held a third-class medical certificate issued on April 21, 2004, with no restrictions. The pilot indicated on his application for the third class-class medical certificate that he had accumulated 60 hours total flight time. Review of FAA Form 8710-1 Airman Certificate and or Rating Application for a multiengine check ride dated March 28, 2007, revealed the pilot has 1,113 total flight hours of which 20 hours are in multiengine airplanes. A friend of the pilot stated the pilot had his pilot logbook in the airplane. The logbook was not located at the crash site.

AIRCRAFT INFORMATION

Review of the airplane log books revealed the last annual and 100-hour inspection was conducted on June 12, 2006, at Hobbs time 1270.2 hours. The total time at the inspection was 9204.2 hours. Teledyne Continental Motors completed a factory rebuild on the left engine on November 15, 2002. The engine was zero timed on November 14, 2002. The total time since rebuild was 358.8 hours. Teledyne Continental Motors completed a factory rebuild on the right engine on January 16, 1998, and it was zero timed. The right engine was installed on the airplane on April 7, 1999, and has 916.8 hours since rebuild. The airframe total hours at the time of the accident was 9260.8 hours. The Hobbs time at the accident site was 1326.8 hours. A friend of the pilot stated the airplane was topped off with 100-low lead fuel on April 19, 2007,

after he and the pilot returned from Lakeland, Florida.

Examination of the maintenance records for the airplane revealed that on October 20, 1995, at tachometer time 6496, Airline Training Center, Arizona, "Removed wing bolts due to manufactures recommendation. Installed new wing bolts, nuts, and washers coated with MIL-C-16173D corrosion preventive compound. In accordance with current Beech craft Service Manual W/O 6466." In addition another entry on October 20, 1996, revealed, "This aircraft had cracks in spar carry thru structure fwd and aft per attached sheet. Installed rear spar kit 50-4008-11S SN 411. Installed fwd spar kit 50-4008-9S S/N 428. Installation per drawing 50-4008. See 337 this date. W/O 6466." Airworthiness Directive (AD) 90-08-14, dated May 7, 1990, was issued to prevent cracks in the wing forward spar carry-through web structure. Review of the AD Compliance Record indicates the AD was completed on October 20, 1995. Examination of the airplane revealed the components required by the AD were installed.

METEOROLOGICAL INFORMATION

The nearest weather reporting facility at the time of the accident was Thomaston-Upson County Airport, Thomaston, Georgia, located about 16 miles south of the accident site. The 1540 surface weather observation was: winds 200 degrees at 5 knots, visibility 10 miles, clear, temperature 77 degrees Fahrenheit, dew point temperature 48 degrees Fahrenheit and altimeter 30.25.

A high-pressure system dominated across the southeast and resulted in an extensive area of clear skies and light winds over Alabama and Georgia. The observations surrounding the area all reported clear skies and unrestricted visibility.

Review of pilot reports in the immediate vicinity of Atlanta at 1505, revealed several types of aircraft reported moderate turbulence between 3,000 and 7,000 feet. Aircraft sounding in the vicinity of Atlanta at 1600 indicated a temperature inversion between approximately 7,000 to 9,500 feet with wind direction and speed changes, which implied potential light to moderate turbulence between these layers. The satellite imagery indicated clear skies over the route of flight, no thunderstorms or other severe weather signatures were indicated.

No AIRMETS, SIGMETS, CONVECTIVE SIGMETS, or Center Weather Advisories were current below 18,000 feet along the route of flight.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located on or near the dirt portion of Hoody Hudson Road off of Hamilton-Mulberry Grove Road in a heavily wooded area in Harris County in the vicinity of Hamilton, Georgia. The crash debris line extended 1,108.8 feet, along an east-west line. The coordinates for the crash site were 32 degrees, 42 minutes, 37 seconds North latitude and 84 degrees, 56 minutes, 50 seconds West longitude.

Examination of the crash site revealed the rudder assembly separated from the vertical stabilizer at the upper and lower hinge points, and the rudder torque tube. The rudder tip cap and balance weight separated from the rudder. The rudder trim tab was damaged and remained attached to the rudder and rudder trim tab actuator. The rudder trim tab was displaced to the left and the actuator extension was measured at four and five-eighths inches which equates to 23 degrees tab left. The rudder hinge pins were intact and the hinge supports were pulled from the vertical stabilizer rear spar. Damage on the rudder revealed over travel to the left and right.

The left horizontal stabilizer was located 94 feet down the crash debris line. The left horizontal stabilizer separated in two main pieces. The first piece included leading edge structure from the root extending outboard about five feet. The second piece consisted of the remainder of the left horizontal stabilizer including the forward spar with an attached section of the fuselage bulkhead and a section of the right forward spar inboard of the attach point. The left horizontal stabilizer forward spar exhibited "s" bending along its length. The left horizontal forward spar was twisted longitudinally about twenty-seven inches outboard of the horizontal stabilizer root extending outboard to the horizontal stabilizer tip. The rear spar fractured inboard of the trim tab actuator. The section of the rear spar from the root extending outboard to the trim tab actuator was not recovered. The left elevator outboard and middle hinges were pulled from the stabilizer rear spar. The majority of the left hand elevator was not recovered. About one foot ten inches of the left elevator was recovered with the elevator torque arm attached and one inch of the elevator control rod was attached to the elevator torque arm. The elevator tip cap and balance weight were recovered. The left elevator trim tab was damaged and separated from the left elevator with the piano hinge and elevator rear spar attached. Eight and one-half inches of the elevator trim control rod remained attached to the left elevator trim tab control. One and one-half inches of the left elevator trim tab control rod remained attached to the left horizontal stabilizer. The left elevator trim tab actuator extension measured one and one-half inches, which equates to 24 degrees tab down.

The right horizontal stabilizer was located 134 feet down the crash debris line. The right horizontal stabilizer separated at the root and was recovered intact. The right horizontal stabilizer was bent upward along a 45-degree crease beginning about ten inches outboard of the stabilizer root and angled back towards the stabilizer root. The right elevator was separated and recovered in six pieces. The outboard elevator hinge was pulled from the stabilizer rear spar and the middle hinge was intact with an attached segment of the elevator. The right elevator trim tab separated from the right elevator along the piano hinge. The right elevator trim tab actuator extension measured one and three-eighths inches, which equates to 18 degrees tab down. One and three-quarters inch of the right elevator trim tab actuator rod remained attached to the right elevator trim tab actuator. Two inches of the right elevator trim tab control rod was attached to the right elevator trim tab. The right elevator torque arm and mounting structure was separated and not recovered.

A section of the empennage rear bulkhead with the entire vertical stabilizer rear spar, a fourteen inch section of the right horizontal stabilizer rear spar, rudder bell crank, and rudder

trim tab control cable attached was located 165 feet down the crash debris line. Four and one-half inches of the left rudder control cable remained attached to the rudder bell crank. Eighteen feet nine inches of the right rudder control cable remained attached to the rudder bell crank.

The vertical stabilizer separated from the empennage and was suspended in a tree about twelve feet above the ground 289 feet down the crash debris line. The rear spar separated from the entire length of the vertical stabilizer. The forward vertical stabilizer attachment point was bent and twisted to the right in relation to the vertical stabilizer.

The aft cabin door forward section separated from its hinges and was located 353 feet down the crash debris line. The lower door latch pin was in the lower extended position.

The forward cabin door was located 428 feet down the crash debris line. The cabin door separated with the hinges attached. The aft door bolt was bent downward. The upper door latch pin was separated and the upper door hook was separated. The lower door latch pin was partially separated from the door structure.

The right wing inboard section was located 580.8 feet down the crash debris line. The right inboard wing section separated at the wing root and included about seven feet six inches of the rear spar, five feet of the forward spar, the structure between the spars, the flap, the leading edge of the wing under the nacelle, and the right main landing gear. The outboard ends of the forward and rear spars exhibited downward deformation and the outboard lower forward spar cap exhibited buckling damage. The upper forward wing spar fitting was intact with deformation to the forward side of the bore. The lower forward wing spar fitting was fractured and the fractured portion remained attached to the center wing. The aft upper and lower wing spar fittings and bolts remained intact. The lower aft wing attachment bolt retained a portion of the wing bolt fitting from the center wing.

The fracture on the lower forward ligament on the lower aft wing bolt fitting exhibited an appearance different from the other ligaments. The mating fracture surfaces of the wing bolt fitting were removed from the right inboard wing and center wing section and forwarded to the NTSB Materials Laboratory for further examination. Examination of the fracture surfaces by the NTSB Materials Laboratory with the aid of a binocular microscope revealed that all portions of the fractures in both fittings contained features typical of overstress separations, with most fracture areas having a matte gray appearance and a fracture plane at approximately a 45-degree angle. Necking down deformation was noted in the fittings adjacent to the upper sides of the fractures, and downward bending was noted adjacent to the lower sides of the fractures, consistent with downward aerodynamic loading of the wings at the time of the fracture. The lower corner of the fracture through the forward leg of the right fracture contained smeared concentric lines on a flat transverse plane, and the ligament of the fracture containing this feature was twisted. "These features are consistent with this portion of this fracture being created as a result of twisting or torsional loading applied after most of the remainder of the fitting was fractured. No evidence of fatigue cracking or other preexisting damage was noted on any of the fractures."

The inboard one foot four inches of the leading edge of the right wing was separated extending aft to the front spar. The right firewall, nacelle, engine and propeller assembly separated from the right wing. The right flap was damaged and remained attached to the rear spar. The right flap actuator extension measured two inches, which equates to the flaps in the retracted position. The right aft fuel tank bladder and leading edge bladders were ruptured. The right fuel selector was in-between the main and off position. The right main landing gear was in the retracted position. No flight control cables were observed in the right inboard wing.

The outboard right wing was located 103 feet left of the right inboard wing and 486 feet down the crash debris line. Twelve feet three inches of the outboard right wing separated outboard of the right engine nacelle. The leading edge of the right outboard wing was intact. The damage at the inboard end was consistent with downward separation. The wing was bent upward one feet eight inches inboard of the wing tip. The fuel cap was intact with a tight seal. An undetermined amount of fuel was present in the ruptured fuel bladder. The right aileron was over extended in the down position (right wing up attitude.) The right aileron bell crank remained attached to the wing structure. Both aileron control cable attach fittings separated from the aileron bell crank. The right aileron control tube separated one and one-quarter inches aft of the aileron bell crank, and remained attached to the aileron bell crank and aileron.

The left wing was located 739.2 feet down the crash debris line. The left wing and engine were recovered intact. The left wing separated at the wing root. The forward upper and lower wing spar fittings fractured through the fitting bores. The forward upper wing spar fitting fractured in the forward direction and the lower wing spar fitting fractured in the downward direction. The aft upper and lower wing attachment bolts remained attached to the wing structure and retained portions of the wing bolt fittings from the center wing. The fracture surfaces on the lower forward and aft ligaments on the lower aft wing bolt fitting exhibited appearances different from the other ligaments. The mating fracture surfaces were removed and forwarded to the NTSB Materials Laboratory for further examination. Examination of the fracture surfaces by the NTSB Materials Laboratory with the aid of a binocular microscope revealed that all portions of the fractures in both fittings contained features typical of overstress separations, with most fracture areas having a matte gray appearance and a fracture plane at approximately a 45-degree angle. Necking down deformation was noted in the fittings adjacent to the upper sides of the fractures, and downward bending was noted adjacent to the lower sides of the fractures, consistent with downward aerodynamic loading of the wings at the time of the fracture. The lower corner of the fracture through the forward leg of the right fracture contained smeared concentric lines on a flat transverse plane, and the ligament of the fracture containing this feature was twisted. "These features are consistent with this portion of this fracture being created as a result of twisting or torsional loading applied after most of the remainder of the fitting was fractured. No evidence of fatigue cracking or other preexisting damage was noted on any of the fractures."

The left flap was damaged and remained attached to its hinges in the retracted position. The left aileron remained attached to its hinges, and the aileron trim remained attached and was

not damaged. The aileron trim tab actuator extension measured two inches, which equates to 12.5 degrees tab down. The left aileron bell crank remained attached to the wing and the aft aileron control cable was attached to the bell crank. The forward arm of the aileron bell crank was separated and the forward control cable was separated from the arm. The aileron control rod fractured at the forward jam nut. The aft aileron control cable was continuous to the wing root and exhibited a splayed end. The forward aileron control cable, out to the bell crank attach fitting was found attached to the fuselage structure.

The left wing was bent down along the length of the forward spar. The leading edge of the left wing inboard of the engine nacelle was damaged. The upper and lower engine cowlings were damaged and attached. The inboard section of the firewall was displaced from the nacelle. The engine assembly was displaced to the left. The leading edge of the left wing outboard of the nacelle was damaged. The left wing tip was bent down and separated at the top rivet line of the wing tip. The left main fuel cap was intact with a tight seal. An undetermined amount of fuel was in the left main fuel tank. The left main fuel selector was in the off position. The left main landing gear was in the retracted position.

Examination of the left engine revealed the engine assembly separated from the engine mounts at the engine. The engine mounts remained attached to the engine firewall. All engine accessories remained attached to the engine crankcase. The electrical wiring harness was damaged and all flexible fluid lines aft of the engine were intact and attached to the firewall. The throttle control at the throttle body was close to the idle position. The mixture control was at full rich. The propeller control arm at the propeller governor was not damaged and found in the feathering detent position.

The engine was partially disassembled. The exterior housing of the vacuum pump was damaged. The vacuum pump was removed and the main rotor drive shaft rotated freely by hand. The drive shaft coupling was intact and not damaged. The vacuum pump was disassembled and the carbon rotor and vanes were not damaged. The ignition leads for the left and right magnetos were attached and not damaged. All top and bottom spark plugs were removed and exhibited gray color and "normal" condition in accordance with the Champion Check-A-Plug Chart.

The fuel lines were disconnected from the fuel pump and mixture control assembly. The fuel pump inlet line was fractured at the fuel pump and no fuel was present. Fuel was present in the metered fuel line to the fuel flow transducer. The throttle body assembly and engine driven fuel pumps were removed and a trace amount of fuel was present in both. The throttle body assembly was intact and not damaged. The throttle valve was actuated freely by hand with a corresponding movement of the mixture control assembly. The mixture control idle cut off/full rich mixture shaft made full travel. The throttle cable and mixture control cables were attached at the throttle body. The mixture control safety wire had a factory TCM lead seal installed. The mixture control fuel screen was removed and no contaminants were observed. The engine driven fuel pump drive shaft was rotated with a power drill at various rpm's and a corresponding flow of fuel was noted. The engine driven fuel pump coupling was intact and

not damaged. The engine driven fuel pump rotated freely by hand. The fuel injector nozzles were removed and were free of contaminants. The fuel manifold was removed and fuel was present. The TCM lead seal was not present. The fuel manifold was disassembled and a blue clear liquid was present. The diaphragm was intact and not damaged. The fuel manifold screen was free of contaminants. The hold nut on the diaphragm assembly was not loose.

The starter was intact and not damaged. The alternator was intact and exhibited exterior damage. The alternator was removed and rotated freely by hand. The propeller governor was not damaged. No contaminants were noted in the propeller governor oil screen. The propeller governor drive was turned by hand and produced oil. The engine oil pressure relief valve was intact and no anomalies were noted. The engine oil filter was removed and cut open. The filter media was free of contaminants. The oil cooler was damaged and no oil was present in the oil cooler. The engine oil pump was removed and was intact. The inside of the oil pump cavity revealed light scratches and no evidence of hard partial passage.

All cylinder rocker covers were removed and oil was present. The No. 5 rocker cover was breached and damaged. The crankshaft was rotated by hand, valve and drive train continuity was confirmed, and continuity was established with all accessory gears. Suction and compression was obtained on all cylinders. The engine was rotated using the starter and a 24-volt battery jump cart. When the engine was rotated a blue spark was noted at all 12-ignition leads. The inside of all six cylinders were examined with a lighted bore scope. No damage was noted to the piston domes, valves, or cylinder walls. Hone signatures were present in the cylinder bore ring travel area.

The left engine was transported to Teledyne Continental Motors for an engine run. The engine and accessories were reassembled in the presence of an FAA inspector. The engine was placed in an engine test cell, started, and ran. Teledyne Continental Engines concluded, "The operation of this engine was normal and did not reveal any abnormalities that would have prevented normal operation and production of rated horsepower."

The left propeller assembly remained attached to the crankshaft propeller flange. The propeller spinner remained attached to the aft spinner bulkhead. The left propeller was transported to McCauley Propeller Systems for further examination. All three-propeller blades were in the latched position. Examination of the propeller blade hub revealed the No. 2 counter weight bolt was bent. A mark was present on the No. 2 hub socket, which is near the feather position of the counter weight. One propeller blade remained attached to the propeller hub and was connected to the pitch change mechanism. The blade was straight with no blade bending. Another propeller blade has an inboard rearward bend at about 12 inches outboard of the propeller centerline. The remaining outboard portion of the propeller blade was not bent. Cambered side diagonal scratches were present along the propeller blade length. The remaining propeller blade remained attached to the propeller hub and was connected to the pitch change mechanism. The propeller blade was straight with no propeller blade bending. McCauley propellers concluded the "Left propeller was feathered at impact,... and there was no indications of any type of propeller failure prior to impact."

The forward fuselage was located 844.8 feet down the crash debris line on a heading of 260 degrees magnetic. The forward fuselage was separated from the aft cabin area at the instrument panel. The forward fuselage impacted a tree and the radome was separated. The nose landing gear was partially separated and over extended. The right baggage compartment door was separated and not observed. The cabin windscreen was destroyed.

Both right hand rudder pedals separated at the control arms. The rudder bell crank interconnect rod separated with a portion of the right hand rudder bell crank attach arm. The left rudder control cable separated with the outboard left hand rudder bell crank attach arm. The separated portion of the left hand rudder bell crank attach arm and attached left hand rudder control cable terminal fitting was recovered in the aft cabin area. The right hand rudder cable was attached to the inboard arm of the left hand bell crank. The right hand rudder cable terminated about fourteen feet aft of the forward cabin separation. The right hand rudder control cable termination was splayed. The aileron control cables were both connected to the aileron forward chain and looped continuously around the aileron sprockets.

One aileron control cable terminated about four feet aft of the forward cabin separation. The other aileron control cable terminated about eleven feet-four inches aft of the forward cabin separation. Both aileron control cable terminations were splayed. One elevator control cable was attached to the elevator bell crank and extended about ten feet aft of the forward cabin separation. The elevator control cable termination was splayed. The other elevator control cable separated with the aileron bell crank attach arm and was not recovered.

Both control wheels were separated with their associated mounting tubes and were located in the forward cabin. The right hand torque shaft assembly separated from the forward channel.

All propeller and engine control cables were attached to their respective control levers and had separated in the vicinity of the forward cabin separation.

The aft cabin area came to rest on its left side 792 feet down the crash debris line on a heading of 060 degrees magnetic. The aft cabin separated from the forward fuselage at the leading edge of the right wing. A portion of the lower right forward wing spar fitting remained attached to the center wing along with the attachment bolt. The upper right forward wing attachment bolt remained in the wing bolt fitting in the center wing and the wing attachment nut had separated. The lower right aft wing bolt fitting was separated. The upper right aft wing bolt fitting was separated. The upper and lower left forward wing attach bolts remained attached to the wing bolt fittings with portions of the respective wing spar fittings attached. The upper and lower left aft wing bolt fittings were fractured.

The aft cabin forward door separated and the hinge remained attached to the fuselage. The aft cabin rear door separated and was not located. The aft door cabin hinge remained attached to the fuselage. The aft fuselage side structure separated from the lower fuselage aft of the aft cabin door. The empennage separated seven feet aft of the aft cabin door. The elevator bell

crank separated with its mounting structure. The upper and lower cable attachment arms separated. Two inches of the right elevator control rod remained attached to the elevator bell crank. Twenty inches of the left elevator control rod remained attached to the elevator bell crank. The cabin roof was compressed downward about four feet two inches aft of the windscreen. The aft fuselage was partially separated from the cabin roof about eight inches aft of the aft cabin door. Examination of the nose landing gear actuator arm position revealed the landing gear was in the retracted position.

The left forward seat was separated from the center seat track, and the seat track was separated from the fuselage. The seat back was separated at the inboard attachment. The lap belt was attached to the seat frame. No shoulder harness was located.

The right forward seat was attached to all three seat tracks. The seatbelt was unbuckled. The adult passenger was ejected from the airplane. No shoulder harness was located.

The right rear-facing seat separated from the seat tracks. The seatbelt was in use. The adult passenger was ejected from the airplane with the seat.

The left rear-facing seat was attached to the seat tracks. The seatbelt was buckled and cut by emergency responders, and a shoulder harness was observed.

The left rear forward facing seat separated from the fuselage. The seatbelt position was not determined.

The right rear-facing passenger was located 1,108.8 feet down the crash debris line with his seat attached.

The right front passenger was located 1,003.2 feet down the crash debris line.

The right engine was located 950.4 feet down the crash debris line. The upper and lower engine cowling was damaged and attached.
The engine assembly remained attached to all engine mounts. The engine mounts remained attached to the engine firewall. All engine accessories remained attached to the engine crankcase except for the alternator. The electrical wiring harness was damaged and all flexible fluid lines aft of the engine were intact and attached to the firewall. The throttle control at the throttle body was at the wide open/full throttle position. The mixture control was half way between full rich and idle cut off. The propeller control arm at the propeller governor was damaged and the upper portion with the control arm was missing.

The engine was partially disassembled. The upper portion of the vacuum pump was damaged. The vacuum pump was removed and the main rotor drive shaft would not rotate. The drive shaft coupling was intact and not damaged. The vacuum pump was disassembled and the carbon rotor was fractured. The ignition leads for the left and right magnetos were attached at the magnetos at the distributor cap. The ignition leads at the No. 2, No. 4, and No. 6 cylinders

top and bottom fractured at the feral nuts. All top and bottom spark plugs were removed and exhibited gray color and "normal" condition in accordance with the Champion Check-A-Plug Chart. The No. 6 lower spark plug at the upper housing lower bushing-mating surface separated.

The fuel lines were disconnected from the fuel pump and mixture control assembly and fuel was present at the mixture control inlet line and at the throttle body. The throttle body assembly and engine driven fuel pumps were removed and trace amounts of fuel were present in both. The throttle body assembly was intact and not damaged. The throttle valve was actuated freely by hand with a corresponding movement of the mixture control assembly. The mixture control idle cut off/full rich mixture shaft made full travel. The throttle cable and mixture control cables separated at the throttle body. The mixture control safety wire had a factory TCM lead seal installed. The mixture control fuel screen was removed and no contaminants were observed. The engine driven fuel pump was rotated with a power drill at various rpm's and a corresponding flow of fuel was noted. The engine driven fuel pump coupling was intact and not damaged. The engine driven fuel pump rotated freely by hand. The fuel injector nozzles were removed and free of contaminants. Fuel injector nozzles 2, 4, and 6 were damaged. The fuel manifold was removed and fuel was present. The TCM lead seal was present. The fuel manifold was disassembled and a blue clear liquid was present. The diaphragm was intact and not damaged. The fuel manifold valve screen was free of contaminants. The hold nut on the diaphragm assembly was not loose.

The starter was intact and not damaged. The alternator separated from the crankcase 1, 3, and 5 cylinders side. The alternator was not located. The propeller governor was damaged. No contaminants were noted in the propeller governor oil screen. The propeller governor drive was turned by hand and produced oil. The engine oil pressure relief valve was intact and no anomalies were noted. The engine oil filter was removed and cut open. The filter media was free of contaminants. The oil cooler was damaged and no oil was present in the oil cooler. The engine oil pump was removed and was intact. The inside of the oil pump cavity revealed light scratches and no evidence of hard partial passage.

All cylinder rocker covers were removed and oil was present. The No. 1, 3, and 5 rocker covers were breached and damaged The crankshaft was rotated by hand, valve and drive train continuity was confirmed, and continuity was established with all accessory gears. Suction and compression was obtained on all cylinders. The engine was rotated using the starter and a 24-volt battery jump cart. When the engine was rotated a blue spark was noted at all 12-ignition leads. The interiors of all six cylinders were examined with a lighted bore scope. No damage was noted to the piston domes, valves, or cylinder walls.

The right propeller separated at the crankshaft propeller flange. The propeller spinner remained attached to the aft spinner bulkhead. The right propeller was transported to McCauley Propeller Systems for further examination. The examination revealed one propeller remained attached and was locked in the propeller hub. Gouging was present on the non-cambered side of the propeller blade eight inches outboard of the propeller blade root. Another

propeller blade was loose in the propeller hub. The propeller was bent aft five inches outboard of the propeller blade root and eight inches and "S" bending was present. Scratches were present on the cambered side of the propeller blade. Chord wise scarring was present on the non-cambered side of the propeller blade. The leading edge of the propeller blade was oriented to a higher pitch angle. The remaining propeller blade was tight in the propeller hub. The propeller blade is bent seven inches outboard of the propeller blade root with "S" bending. The cambered and non-cambered side of the propeller blade exhibited span wise scratching. A knick was present in the propeller blade tip. McCauley concluded, "The right propeller was operating in the low pitch blade angle range at impact. Exact amount of power being absorbed by the right propeller at impact was not determined....Counterweight impression marks in the right propeller spinner shell indicate that the propeller was in the normal operating blade angle at impact....Propeller damage was a result of impact. There were no indications of any type of propeller failure prior to impact."

TEST AND RESEARCH

The Garmin GPS, Model 496 was forwarded to the NTSB Vehicle Recorder Laboratory for analysis. The accident data was downloaded using Garmin Map Source V6.11.1. The airplane departed Lakeland, Florida, at about 05:51 PM on April 19, 2007, returned to Griffin, Georgia, and landed at about 08:06 PM. During the return flight, the data shows evidence of the aircraft making two maneuvers inconsistent with straight and level cruise flight. Altitude recordings during this period started out at 8,300 feet, the airplane descended to a low of 7,759 feet and ended up at 8,000 feet. The recorded ground speed varied from 210 mph at the beginning to a high of 230 mph.

The download revealed the airplane departed Jack Edwards Airport on April 22, 2007, at about 12:45 from runway 09. The airplane flew to the northeast at a cruise altitude of about 9,700 feet at a recorded groundspeed of 220 mph. During the last 20 seconds of flight the airplane descended from 9,470 feet to 8,478 feet at 02:50:42 PM. The groundspeed varied from 222 mph to a high of 266 mph.

The JP Instruments EDM 760 was forwarded to the NTSB Vehicle Recorder Division. The engine-monitoring device was in good condition and the data it contained were extracted normally using the manufacturers recommended software tool. The resulting download contained data from the last 11 flights or powered applications on the airplane. The flights of interest were converted by the EZ trends software into comma separated value (CSV) data for plotting. Timing of the data is to the nearest second and the accident flight was corrected to establish the time of the accident at 1451 Eastern Daylight Savings Time. Plots 1 and 2 contain information describing the flight on April 22, 2007 during which the subject event occurred. Plot 1 contains information on both engines for the entire flight. Plot 2 contains similar parameters but only shows the last 30 minutes of flight. Plot 3 contains data of the flight flown on April 19, 2007. This plot was plotted because the airplanes right engine was shut down in flight. The plot depicts the data from both engines over the entire 2 hour and 9 minute flight.

MEDICAL AND PATHOLOGICAL INFORMATION

The Georgia Bureau of Investigation Medical Examiner conducted a postmortem examination of the pilot, on April 24,2007.The reported cause of death was "extensive blunt force trauma". The Forensic Toxicology Research Section, Federal Aviation Administration, Oklahoma City, Oklahoma, performed postmortem toxicology of specimens from the pilot. The results were negative for ethanol. An undetermined amount of meclizine was detected in the blood. No testing was performed for carbon monoxide or cyanide.

The Georgia Bureau of Investigation Medical Examiner conducted a postmortem examination on the right front seat passenger on April 24, 2007. The reported cause of death was" multiple injuries."

The Georgia Bureau of Investigation Medical Examiner conducted a postmortem examination of right rear facing passenger on April 24, 007. The reported cause of death was "multiple injuries."

The Georgia Bureau of Investigation Medical Examiner conducted a postmortem examination of the left rear-facing passenger on April 24, 2007. The reported cause of death was "multiple injuries."

The Georgia Bureau of Investigation Medical Examiner conducted a postmortem examination of the left rear forward facing passenger on April 24, 2007. The reported cause of death was "multiple injuries."

ADDITIONAL INFORMATION

Review of the Beech Baron Model 58/58A Pilot's Operating Handbook (POH) and Airplane Flight Manual states in Section II Limitations, Page 2-3 that the Never Exceed Speed (VNE) is 223 IAS. The Maximum Structural Cruising speed (VNO) is 195 IAS. The maximum Maneuvering speed is 156 IAS.

The POH states in Section II Limitations, page 2-9, MANEUVERS, "This is a normal category airplane. Acrobatic maneuvers including spins are prohibited."

The wreckage and components retained for further examination by the NTSB Vehicle Recorder Division and the NTSB Materials Laboratory were released to Atlanta Air Recovery, Griffin, Georgia on June 21, 2007.

Pilot Information

Certificate:	Private	**Age:**	34,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:**	April 1, 2004
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 1, 2007
Flight Time:	1113 hours (Total, all aircraft), 20 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N5647C
Model/Series:	58	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	TH1574
Landing Gear Type:	Retractable - Tricycle	**Seats:**	5
Date/Type of Last Inspection:	June 1, 2006 Annual	**Certified Max Gross Wt.:**	5524 lbs
Time Since Last Inspection:	57 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	9261 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO550-C
Registered Owner:	Renaissance Aircraft Management LLC	**Rated Power:**	300 Horsepower
Operator:	Jesse R. Champion	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KOPN,1758 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	15:40 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.23 inches Hg	**Temperature/Dew Point:**	25°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Gulf Shores, AL (KJKA)	**Type of Flight Plan Filed:**	None
Destination:	Griffin, GA (6A2)	**Type of Clearance:**	None
Departure Time:	13:00 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	4 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	5 Fatal	**Latitude, Longitude:**	32.710277,-84.947219

Administrative Information

Investigator In Charge (IIC):	Smith, Carrol
Additional Participating Persons:	Richard C Curtis; College Park FSDO-11; College Park, GA Jason Lukasik; Teledyne Continental; Mobile, AL Mike Gibbons; Raytheon Aircraft Company; Wichita, KS
Original Publish Date:	August 30, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65612