

Cirrus NTSB Database

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Last Updated 2008 January 18

FATAL ACCIDENTS

2007

2007-1230 SR22 N254SR (1) Maneuvering? Preliminary

2007-1128 GE SR20 N414CD (1) NIGHT IMC APPROACH Factual

2007-1125 MN SR22 N482SR (4) WIND LANDING Preliminary

2007-1121 SR20 N108GD (1) IMC APPROACH MISSED Preliminary

2007-0202 GL SR20 N901SR (1) OIL PRESSURE DITCHING Factual

2006

2006-1218 AZ SR22 N457S (1) VFR2IMC? NIGHT? Preliminary

2006-1130 NC SR22 N665CD (1) NIGHT IMC APPROACH Preliminary

2006-1027 NC SR22 N969ES (2) IMC APPROACH Probable Cause

2006-1025 AZ SR22 N121LD (4) Icing? TS? Preliminary

2006-1011 NY SR20 N929CD (2) MANEUVERING STALL Probable Cause

2006-0915 CO SR20 N787SL (2) ICING TS Probable Cause

2006-0711 MD SR22 N8163Q (1) LANDING GO AROUND Probable Cause

2006-0204 FL SR22 N667WP(3) INSTRUMENT PROBLEMS IMC Factual Report

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2006-0109 CA SR20 N526CD MANEUVER TRAINING Probable Cause

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2005

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2005-1229 NC SR22 N799TM (2) VFR2IMC Probable Cause

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2005-1211 MN SR22 N621PH (3)VFR2IMC Probable Cause

2005-0206 CA SR22 N286CD (1) NIGHT ICING Probable Cause

2005-0120 OR SR22 N6057M (3) NIGHT VFR2IMC Probable Cause

2005-0115 FL SR22 N889JB (1) IMC VECTOR/APPROACH Probable Cause

2004

2004-0910 MT SR22 N1159C (3) MANEUVERING STALL Probable Cause

2004-0910 WI SR22 N1223S (1) APPROACH STALL Probable Cause

2004-0419 SC SR22 N8157J (4) TAKEOFF STALL Probable Cause

2003

2003-1012 SP SR22 N100BR (4) Factual

2003-0123 CA SR20 N893MK (1) IMC VECTORING Probable Cause

2003-0118 MN SR22 N9523P (2) NIGHT VFR2IMC Probable Cause

2002

2002-1103 NM SR20 N566T VFR2IMC Probable Cause

2002-0528 NM SR20 901CD Takeoff CFIT Probable Cause

2002-0424 NY SR22 N837CD (2) MANEUVERING STALL Probable Cause

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2001-0410 AZ SR20 N116CD (3) VFR2IMC Probable Cause



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On December 30, 2007, about 1140 Pacific standard time, a Cirrus SR22, N254SR, departed controlled flight and collided into the slope of a hill near Paso Robles, California. Cirrus Design Corporation was operating the airplane under the provisions of 14 CFR Part 91. The certificated flight instructor, the sole occupant, sustained fatal injuries. The airplane was substantially damaged. The personal flight departed San Carlos Airport, San Carlos, California, about 1030, with a planned destination of Paso Robles Municipal Airport. Visual meteorological conditions prevailed, and no flight plan had been filed.

The National Transportation Safety Board investigator-in-charge (IIC) interviewed a close friend of the pilot during the investigation, including immediately following the accident. He stated that the pilot was planning to visit him for the weekend, flying from his base airport to Paso Robles, as he had done many times prior. The pilot called him on a cellular telephone while in the airplane approaching the proximity of the friend's residence informing him that he was about to pass by. The pilot had done this on many occasions to let the friend know that he was about to land, as a way of notifying him that he should leave to pick him up from the airport, which was an approximate 15-minute drive.

The pilot's friend further stated that he proceeded outside to watch the airplane while speaking with the pilot on the telephone. He observed the airplane drop rapidly about 1,000 feet as it was flying toward his house. As the airplane was approaching his house in a nose-high configuration with full power, he heard the telephone drop and the pilot make a few inaudible comments. He noted that with the orientation of the airplane to the terrain he was nervous of an impending crash. The airplane then made a rapid ascent in a near vertical nose-high maneuver climbing to about 1,000 feet above ground level (agl). It subsequently made a 90-degree right turn and then continued to turn into a barrel roll, disappearing behind the tree line ahead. He noted that he heard the engine producing full power during the maneuver.

Numerous witnesses were interviewed by the IIC following the accident. One witness, who lived adjacent to the pilot's friend, stated that she was trimming olive trees that surround her property when she noticed an airplane fly over her house. The airplane continued slightly left [east] and was maneuvering at a "very, very, very low" altitude. Another witness recalled observing the airplane flying from the east and over his house at an altitude of about 200 feet. He noted that the airplane was flying very fast and descended to about the tree-top level. The airplane then began a rapid ascent, almost vertical. After gaining altitude it rolled to the right and then began a loop below the tree line, where he lost visual contact.

An additional witness, whose property is oriented on a small hill about 100 feet above the valley floor stated that from his vantage point he observed the airplane looking downward as it passed by, which he approximated was maneuvering at 75 feet agl. The airplane was flying rapidly through the valley and began a rapid ascent as it reached the end of the west property lines of the neighbors. The witness further recalled that he has seen a low flying airplane in the neighborhood previous to the accident. He specifically recalled that about 2 months prior, an airplane flew about 50 feet above his house. Many of his neighbors and him have discussed an airplane that maneuvers very low in the area.

Records established that the airplane was fueled with the addition of 44.2 gallons of aviation fuel on the day of the accident.

The closest official weather observation station was in Paso Robles Airport, located about 10.5 nautical miles (nm) northwest of the accident site at an elevation of 836 feet mean sea level

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(msl). An aviation routine weather report (METAR) for the airport was issued at 1153. It stated: winds from 310 degrees at 5 knots; visibility 10 statute miles; scattered clouds at 1,700 feet; temperature 13 degrees Celsius; dew point 7 degrees Celsius; altimeter 30.26 inches of mercury.

The wreckage was located on the hills of an estate, stretching over 1,200 feet from the first impact marking to the farthest debris found (right main landing wheel); the main wreckage was located close to the middle. In character, the rolling hills were comprised of dirt and dry grass and populated by scattered oak trees typical of the central California region. The main wreckage was located at an estimated 35 degrees 32.525 minutes north latitude and 120 degrees 31.369 minutes west longitude, at an elevation of about 1,115 feet mean sea level (msl).

The main wreckage came to rest on a northeast facing slope and had been subjected to severe thermal damage. The main wreckage consisted of the left wing and tail section as well as the ashen remains of the fuselage. The cabin was completely consumed by fire. The left wing was inverted though remained on the correct side of the fuselage with the leading edge facing downslope and nearly perpendicular to the debris path. The empennage was aft of the wing spar and attached by sections of partially consumed fiberglass and steel cables; the rudder was askew from the empennage, positioned on the right side of the wreckage. All control surfaces were accounted for at the accident site with the exception of the left aileron. The left aileron's aluminum control surface had sections attached at the respective hinges, but the middle section was absent consistent with it being consumed by fire. The firewall was imbedded under the main wreckage and the engine mounts were broken.

The first identified point of contact consisted of disrupted dirt on a small berm making up the far northern end of the debris field. The markings started as two parallel indentations in the vegetation and dirt. The right crater began about 1 foot before the left; they were about 8 feet apart, consistent in size and orientation to that of the main landing gear. The craters were continuous for about 8 feet and gradually matured into a sole crater measuring about 20 feet wide.

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On November 28., 2007, at 1800 UTC, a Cirrus Design Corporation SR-20, N141CD, serial number 1032, while on approach for landing at Jaleg, Schleswig-Holsteinschen, Germany, struck power lines and subsequently impacted terrain. The airplane was destroyed and the private pilot, the sole person on board the airplane, was fatally injured. Instrument meteorological conditions prevailed at the time of the accident. The cross-country ferry flight originated in the Netherlands and was en route to Sylt, Germany.

This investigation is under the jurisdiction and control of the German government. Any further information may be obtained from:

German Federal Bureau of Aircraft Accidents Investigation
Bundesstelle fur Flugunfallensuchung (BFU)
Herman-Blenk Strasse 16
38108 Braunschweig
Germany

This report is for informational purposes only and contains only information released by, or obtained from, the BFU of Germany.

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NTSB Identification: CHI08FA039

14 CFR Part 91: General Aviation

Accident occurred Sunday, November 25, 2007 in Faribault, MN

Aircraft: Cirrus Design Corp. SR22, registration: N482SR

Injuries: 4 Fatal.

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed.

On November 25, 2007, about 1455 central standard time, a Cirrus Design Corp. SR22, N482SR, was destroyed on impact with terrain during landing on runway 12 (4,254 feet by 72 feet, dry asphalt) at the Faribault Municipal Airport (FBL), near Faribault, Minnesota. A post impact fire occurred. The personal flight was operating under 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed in the area at the time of the accident. No flight plan was on file. The pilot and three passengers sustained fatal injuries. The flight originated from the Aberdeen Regional Airport, near Aberdeen, South Dakota, about 1300, and was destined for FBL.

About 1300, a witness, who was a certified flight instructor, saw a Cirrus airplane attempt a landing and saw it go-around. That Cirrus airplane did not land at FBL. About 1440, the witness was monitoring the Unicom frequency at FBL when the pilot of N482SR advised him of his intentions to land and refuel. The witness stated that he saw N482SR on short final and saw the airplane's go-around. About eight minutes later the witness saw the airplane over runway 12 about 40 feet above the ground in level flight heading towards his location. He reported that about four seconds later the airplane rolled left, and impacted terrain in an inverted attitude. The witness indicated that the airplane impacted terrain left wing down, it cartwheeled, and then the post impact fire and explosion occurred.

At 1456, the recorded weather at FBL was: Wind 190 degrees at 15 knots, gusting to 22 knots; visibility 10 statute miles; sky condition clear; temperature 8 degree C; dew point -4; altimeter 29.77 inches of mercury.

The airplane was found inverted on about a 180-degree magnetic heading in a bean field northeast of runway 12's taxiway about 330 feet northeast of the runway's centerline and about 2,000 feet from the approach end of the runway. The composite portions of airplane's empennage and wings were consumed by fire. The metal portions of the airplane's empennage and wings exhibited deformation, discoloring, and melting. The fuselage, up to the firewall, exhibited damage and charring consistent with a fire. A ground scar was observed

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starting about 48 feet west of the wreckage and lead to the center of the wreckage on about an 80-degree magnetic heading. The shape of the scar's depression was consistent with the inverted shape of the left wing tip. A red navigation light lens was found near the ground scar. A propeller blade had separated from its hub and was found imbedded in a depression in the ground north of the ground scar about 27 feet from the center of the wreckage. The depression's shape was consistent with the shape of the spinner and engine cowling. A propeller blade was found resting within the depression. The third propeller blade that exhibited chordwise abrasions on its back was found about 180 feet from the center of the wreckage on about a 350-degree magnetic heading from the center of the wreckage. The airplane's recoverable data module was deformed, discolored, and was found about 84 feet north of the center of the wreckage. The top of the oxygen bottle was found about 309 feet from the center of the wreckage on about a 70-degree magnetic heading from the center of the wreckage. The airplane's parachute was found extended on the ground starting with its risers near the center of the wreckage and its topmost portion resting about 120-degrees magnetic and 105 feet from the center of the wreckage.

An on-scene examination of the wreckage was conducted. The flight control cables were traced from the cockpit to the linkage for each flight control surface and flight control continuity was established. The ballistic parachute's primer charges were found dimpled. The engine controls cables were traced from the cockpit to their respective engine controls and engine control continuity was established. The engine driven fuel pump shear shaft was intact. The right magneto sustained fire damage and did not produce any spark when it was rotated by hand. The left magneto produced spark at all leads when it was rotated by hand. The gascolator, engine driven and electric fuel pumps, and the fuel line to the manifold valve contained liquid consistent with the smell and color of aviation gasoline. The top sparkplugs were removed and no anomalies were detected. The engine's propeller flange was rotated with a lever. Each cylinder produced a thumb compression. Both turbochargers' compressors rotated when spun by hand.

The airplane's recoverable data module and the engine have been retained for further examination.

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On November 21, 2007, about 0145 eastern standard time, a Cirrus Design Corp. SR-20, N108GD, was substantially damaged when it impacted terrain in New Windsor, New York, while on approach to the Stewart International Airport, (SWF), Newburgh, New York. The certificated private pilot was fatally injured, and two passengers were seriously injured. Instrument meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed for the flight that departed the Lynchburg Regional Airport (LYH), Lynchburg, Virginia. The personal flight was conducted under 14 CFR Part 91.

The airplane was co-owned by the pilot and based at the Wings Field Airport (LOM), near Philadelphia, Pennsylvania.

According to preliminary information obtained from the Federal Aviation Administration, the pilot departed LOM about 1550, on November 20th, and flew to LYH, where he landed about 1800, and picked up the two passengers. The airplane subsequently departed LYH about 2250, and proceeded to SWF without incident. The pilot attempted an instrument landing system (ILS) approach to runway 9, a 11,818-foot-long, 150-foot-wide, asphalt runway, which resulted in a missed approach. The pilot was subsequently directed by air traffic control for a second ILS approach to runway 9, and the airplane was cleared to land when it was about 9 miles from the runway. The pilot acknowledged the landing clearance; however, there were no further communications from the airplane. Preliminary radar data revealed that the airplane was drifting right of the extended runway centerline as it descended toward the runway. The airplane's radar target descended approximately from 1600 feet to 700 feet, and its ground speed slowed from 142 knots to 102 knots during the minute before radar contact was lost at 0144:49. The airplane was subsequently located about 1/10 mile further east of the last radar target.

The airplane impacted trees and uneven terrain within Stewart State forest, about 2 miles from the approach end of runway 9. The airplane came to rest about 65 feet from an initial tree strike, and was inverted, on a magnetic heading of 210 degrees, and on a 070 degree bearing to the runway. All major components of the airplane were accounted for at the accident site.

The right wing remained intact and attached to the airframe. It displayed leading edge damage consistent with tree strikes. The right aileron was detached at the inboard hinge, but remained attached via the outboard hinge. The left wing structure had separated from its flap outboard, exposing the main spar. The left aileron was located on the ground near the initial tree strike. Both wing fuel tanks were compromised; however, fuel was observed leaking from the right wing. The right elevator was bent upward about 45 degrees, and the left elevator and horizontal stabilizer were bent upward about mid-span. The rudder was separated at its upper hinge. Flight control continuity was confirmed from the cockpit to all flight controls except the left aileron. The airplane's left main landing gear remained attached; however, the right main, and nose gear were separated. The engine was separated from its mounts and remained attached to the airframe via hoses and cables. The complete propeller assembly was separated at the crankshaft flange and located at the base of a tree, adjacent to the main wreckage. All three propeller blades were twisted, and displayed varying degrees of chordwise scratches and tip bending. The crankshaft displayed a 45-degree shear lip at the point of the propeller assembly separation and was bent slightly. The crankshaft could not be rotated; however, there was no external evidence of a catastrophic engine failure. Both magnetos were separated from the engine and produced spark from all towers when rotated by hand. All top sparkplugs except for the number 1 cylinder were removed. The number 1 cylinder sparkplug

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could not be removed due to impact damage; however, the bottom sparkplug was removed for examination. The electrodes of all the removed sparkplugs were intact. The engine driven fuel pump contained fuel, it rotated freely and its drive shaft was intact. Measurement of the flap control actuator corresponded to a 50-percent (16 degree) flap setting.

The airplane was equipped with a Cirrus Airplane Parachute System (CAPS). The caps handle in the cabin was displaced from its holder; however, it was noted that the ceiling structure around the handle was buckled. The CAPS access cover was intact and the parachute was found in the stowed position.

The airframe and engine were retained for further examination. A handheld Garmin Global Positioning System (GPS) receiver was located in the cockpit and forwarded to the Safety Board's Vehicle Recorders Division, Washington, D.C.

Review of fueling records from a fixed-base operator at LYH revealed that the airplane was "topped-off" with 22.5 gallons of 100 low lead, aviation gasoline prior to takeoff.

The pilot reported 445 hours of total flight experience on his most recent application for a Federal Aviation Administration third class medical certificate, which was issued on January 22, 2007. He received an instrument rating during January 2006.

A weather observation taken at SWF, at 0145, reported: winds calm; visibility 1/4 mile, runway 09 visibility 3,000 feet, in fog; ceiling 400 feet overcast; temperature and dew point 4 degrees Celsius; altimeter 30.07 inches of mercury.

Review of the ILS runway 9 approach chart revealed that the decision height for the straight-in ILS runway 9 approach was 682 feet, and the touchdown zone elevation was 482 feet.

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On February 2, 2007, at about 1820 Zulu, a Cirrus SR20, tail number N901SR, crashed off the coast of Greenland after the pilot had indicated he had a low engine oil issue and was going to attempt an emergency water ditching. The airplane was destroyed during the water ditching attempt and has not been recovered. There was only one person on board and he received fatal injuries due to water impact. The pilot was recovered with an environmental suit and a life vest on. The Danish Accident Investigation Board (AIB) is investigating. For more information on this accident investigation, you can contact the Danish AIB at email address: aib@aib.dk.

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NTSB Identification: LAX07FA062

14 CFR Part 91: General Aviation

Accident occurred Monday, December 18, 2006 in Young, AZ

Aircraft: Cirrus Design Corp. SR22, registration: N457S

Injuries: 1 Fatal.

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed.

On December 18, 2006, about 1830 mountain standard time, a Cirrus Design Corp. SR22, N457S, impacted mountainous terrain on the northwest portion of the Fort Apache Indian Reservation near Young, Arizona. The private pilot/owner operated the airplane under the provisions of 14 CFR Part 91 as a personal flight. The airplane was destroyed. The instrumented rated pilot, the sole occupant, sustained fatal injuries. Instrument meteorological conditions prevailed for the cross-country flight that departed Winslow-Lindberg Regional Airport (INW), Winslow, Arizona, about 1715, for Henderson Executive Airport, (HND), Las Vegas, Nevada. No flight plan had been filed. The wreckage came to rest at global positioning system (GPS) coordinates of 33 degrees 54.81 minutes north latitude and 110 degrees 41.545 minutes west longitude at an elevation of 4,600 feet mean sea level (msl).

The flight became the subject of an Alert Notification (ALNOT) about 1830 Pacific standard time on December 18, 2006, after the pilot had not checked in with her spouse who was waiting at HND for her arrival.

The National Transportation Safety Board investigator-in-charge (IIC) interviewed the husband of the pilot. He stated that they had spoken at several different times throughout the day of the accident. She had departed Chinle Municipal Airport (E91), Chinle, Arizona, about 1400 for HND. About 45 minutes later, while en route to HND, she called to let her husband know that she was between cloud layers and was going to land at INW. After landing at INW, they spoke again and decided that she would stay overnight in Winslow until the weather cleared.

The husband stated that he contacted Reno Flight Service Station (RNO FSS) and requested a weather briefing; at that time RNO FSS indicated that for the next 24-36 hours there would be a weather buildup passing through New Mexico. He relayed the information to the pilot, and a decision was made for him to drive from Henderson to Winslow and pick her up. About 15 minutes later, the pilot called him to tell him that the skies were clear in INW and she wanted to fly south towards Chandler, Arizona, and then over to HND. He called RNO FSS back at 1500 and received another weather update, which reported: broken and scattered cloud layers at

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9,000 and 11,000 feet msl, and clear skies below 8,500 feet msl. He relayed the updated information to the pilot. At that time, they agreed upon a route of flight from INW down to Chandler, and then over to Henderson. He had no further communications with the pilot.

According to the airport manager at INW, the pilot had borrowed a vehicle from the airport to drive into town and get a hotel room for the night. About 1700 he saw the car parked next to the accident airplane. About 1715, the accident airplane departed INW.

The Safety Board IIC reviewed weather information along the proposed route of flight and noted instrument meteorological conditions (IMC) and a freezing level near 6,500 feet.

On December 23, 2006, at 1445, an Arizona Air National Guard helicopter flight crew spotted a partially deployed orange and white parachute. About 2 hours later, an Arizona Department of Public Safety (DPS) helicopter flight crew responded to the accident site. At 1900, the DPS helicopter transported a team of rescue volunteers from the Tonto Rim Search and Rescue squad to maintain site security until the following morning when a detective from the Gila County Sheriff's Department could respond to the accident site.

The detective noted that the airplane impacted the side of a canyon wall about 200 feet below a mesa. The area was made up of dense trees and scrub brush on a 30-degree slope. The airplane was on a magnetic heading of 134 degrees.

The Safety Board IIC and a representative from Cirrus, a party to the investigation, responded to the accident site. They noted several broken tree branches along the debris path. The CAPS (Cirrus Airframe Parachute System) system had deployed due to impact forces.

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NTSB Identification: NYC07FA037

14 CFR Part 91: General Aviation

Accident occurred Thursday, November 30, 2006 in Huntersville, NC

Aircraft: Cirrus SR-22, registration: N665CD

Injuries: 1 Fatal.

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed.

On November 30, 2006, at 1944 eastern standard time, a Cirrus SR-22, N665CD, fractionally owned by private individuals who delegated the management of the airplane to AirShares Elite, Inc., of Atlanta Georgia, was destroyed when it impacted terrain while executing an instrument approach to Charlotte/Douglas International Airport (CLT), Charlotte, North Carolina. The certificated private pilot was fatally injured. Night instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed. The personal flight, which originated from Dekalb-Peachtree (PDK), Atlanta, Georgia, was conducted under 14 CFR Part 91.

According to preliminary radar data and air traffic control (ATC) information provided by the Federal Aviation Administration (FAA), the airplane departed PDK approximately 1845, and maintained an altitude of 5,000 feet enroute. After arriving in the CLT airspace, the pilot was cleared to descend to 3,000 feet and issued a vector which placed him on a downwind leg for the ILS RWY 18R approach. He was then issued a heading of 090 degrees and cleared for the approach. Radar data indicated that the airplane crossed through the final approach course for runway 18R and continued toward the final approach course for runway 18L. At that time, the air traffic controller alerted the pilot to his heading, and issued a heading of 230 degrees to rejoin the final approach course. As the airplane maneuvered, it descended through an altitude of 2,200 feet, the controller issued a "low altitude warning" and instructed the pilot to "climb and maintain 2,300 feet." During the following 20 seconds, the airplane climbed from 1,800 feet to 3,800 feet, and maneuvered from a heading of 180 degrees to an approximate heading of 330 degrees. During this time, the airspeed decreased from 183 knots to 90 knots, until the final radar return was observed at 1944, approximately 1/4 mile from the accident site.

A witness, whose home was approximately 9 miles from CLT, was familiar with the flight path and aircraft sounds operating into and out of the airport. In a written statement, the witness reported hearing an airplane with a "very high pitch" engine sound, flying in a northeast direction, around 1940. The witness noted that the airplane would have been crossing the arrival path for runway 18R/L, which was different than the other aircraft he observed flying on a southerly heading toward runway 18R/L. The witness stated that the sound seemed to "phase in and out," and sounded as if the airplane was climbing and heading away from the airport. The witness stated that the sound seemed to dissipate, and then he heard the engine "whine" again, as if the airplane was turning right toward the airport. At this point, the witness thought the airplane was headed toward CLT, and approximately 15-20 seconds later, the engine again "wound up to a very high pitch" and it sounded as if the airplane "banked sharply, and began to nose dive." The witness heard the airplane impact the ground about 4 seconds later.

The airplane impacted trees in a heavily wooded area, and was consumed by a post-crash fire. The accident site was located approximately 10 miles from the approach end of runway 18R, at an elevation of 758 feet. The engine, propeller, and a portion of the main wreckage came to

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rest, in an impact crater approximately 2 feet deep, at the base of a 45-foot tall tree. A propeller slash mark was noted in the tree trunk, approximately 15 feet from the top of the tree.

The wreckage path was oriented on a heading of 080 degrees and extended approximately 100 feet from the base of the tree. Located along the wreckage path were fragmented portions of all of the airplane's components and flight control surfaces.

Flight control continuity could not be confirmed to the flight control surfaces, due to impact damage; however, all flight control cables were accounted for and the cable ends were broomstrawed. A measurement of the flap actuator revealed the flaps were in the retracted position.

Examination of the Cirrus Airframe Parachute System (CAPS) revealed the rocket motor was separated from the launch tube, and the rocket buried itself in the ground. The parachute remained in its packed state, separated from its attachment hardware. Examination of additional fragmented sections of the airplane structure, which surrounded the rocket, displayed evidence consistent with an impact sequence deployment.

The engine was removed from the accident site and completely disassembled. The number 2 cylinder was separated from the engine. The number 1, 3, and 5 cylinders remained attached to the engine, but displayed impact damage. The number 4 cylinder was separated from the barrel, and the number 6 cylinder was separated from the crankcase. A torsional break was noted at the propeller flange, and no pre-impact mechanical anomalies were noted with the crankshaft or engine.

All of the engine accessories were separated from the engine. Both magnetos were impact and fire damaged and could not be tested for spark. The fuel pump was separated and the drive coupling was not located. The fuel manifold was separated and the diaphragm, screen, and spring were not located.

The propeller separated from the engine, and one blade of the three-blade propeller separated from the propeller hub. Examination of all three propeller blades revealed S-bending and chordwise scratches.

Examination of the airframe and engine logbooks revealed that the most recent 100-hour inspection was completed on November 22, 2006, with no anomalies noted. The airplane flew 13 hours since the inspection.

The pilot/owner held a private pilot certificate with ratings for airplane single-engine land, multiengine land, and instrument airplane. His most recent FAA third-class medical was issued on October 13, 2005, at which time he reported 1,600 hours of total flight experience.

Weather reported at CLT, at 1952, included wind from 170 degrees at 13 knots, 10 miles visibility, overcast clouds at 800 feet, temperature 66 degrees Fahrenheit, dew point 62 degrees Fahrenheit, and an altimeter setting of 30.10 inches of mercury.

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HISTORY OF FLIGHT

On October 27, 2006, at 1216 eastern daylight time, a Cirrus SR22, N969ES, registered to a private owner, operating as a 14 CFR Part 91 personal flight, collided with trees while maneuvering in the vicinity of Statesville Regional Airport, Statesville, North Carolina. The pilot had been cleared by air traffic control (ATC) for an instrument landing system approach (ILS) to runway 28. Instrument meteorological conditions prevailed and an instrument flight plan (IFR) was filed. The airplane received substantial damage. The private pilot and one passenger received serious injuries. Two passengers were fatally injured. The flight originated from North Palm Beach County General Aviation Airport, West Palm Beach, Florida, on October 27, 2006, at 0900. The flight was en route to a visual flight rules (VFR) airfield, located at Lake Norman Airpark, Mooresville, North Carolina. The pilot diverted to Statesville, North Carolina, due to weather.

Review of transcripts revealed the pilot contacted Charlotte Approach control at 1134 and requested the weather at Charlotte. The controller advised the pilot the weather was 600 broken, 1200 overcast, visibility one and half miles. The pilot asked the controller what the weather was at his destination airport. The controller informed the pilot the weather at Concord Airport ten to 15 miles from his destination was 200 overcast, 2 miles visibility, and mist. The pilot asked the controller to change his destination to Statesville. The controller approved the request, and provided the pilot with radar vectors to Statesville. The controller informed the pilot he was number 4 for the approach, and advised the pilot the displaced threshold to runway 28 was 2,000 feet. In addition, the controller informed the pilot that the airplane ahead of him reported breaking out of the clouds 50 feet above minimums. The pilot acknowledged the transmission. At 1203, the controller informed the pilot he was 7 miles from Pegte intersection, maintain 3,000 feet until established on the final approach course, and the pilot was cleared for the ILS runway 28 approach. The pilot acknowledged the clearance at 1206, and there were no further recorded transmissions with the pilot.

The pilot stated he received a full weather briefing from St. Petersburg, Florida, Lockheed-Martin Automated Flight Service Station for a weather briefing for the IFR flight to Mooresville, North Carolina. The weather was forecasted to be VFR upon his arrival. The ceiling was forecasted to be between 2,500 to 3,000 feet with rain showers and was not forecasted to decrease until between 1430 to 1500. The pilot stated he did not get any en-route weather updates. Before departing the pilot briefed the passengers on the emergency exits, use of restraint systems, and the Cirrus Airframe Parachute System (CAPS); however the pilot did not remove the safety pin on the CAPS before departing or during the flight. Upon arrival in the Charlotte area, the pilot stated he was handed off by ATC to Charlotte approach control, and he was instructed to descend. During the descent the pilot realized the weather at his destination airport may not be VFR. He requested permission from the controller to divert to Statesville. The controller approved his request and provided radar vectors to the ILS runway 28 final approach course. The pilot stated he was flying the airplane with the autopilot, and performed the before landing checks. The pilot extended the flaps to 50 percent and ultimately to 100 percent. The pilot stated he was not cleared by the controller for a circling approach or issued alternate missed approach procedures. The pilot remembered descending below the clouds on the approach, but could not remember any other events associated with the accident.

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Witness stated the airplane was observed on approach for runway 28 at Statesville Regional Airport. The airplane came out of the clouds in the vicinity of taxiway D and continued over the runway to taxiway F. An increase in engine power was heard and the airplane started a right turn and entered the clouds. The airplane was heard north of the airport and was observed again on the south side of the runway traveling from southeast to the northwest located just below the clouds, and crossed runway 28. The airplane entered the clouds and came out of the clouds north of Aviation Drive. The witnesses observed the airplane make a sharp bank to the right estimated at a 45-degree angle of bank followed by a 45-degree left bank. The nose of the airplane was observed to pitch down and the airplane collided with trees and the ground.

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 on June 20, 2003, with ratings for airplane single engine land, and instrument airplane. The pilot held a third class medical certificate issued on December 1, 2005, with the restriction "must have available glasses for near vision."

The pilot attended Cirrus SR22 flight training contracted out to Wings Aloft by Cirrus Design from September 4, 2001, through September 7, 2001. The pilot received 7 hours of ground school and 8.7 hours of dual instruction. The curriculum called for 5 hours of ground school and 7.75 hours of dual instruction including 1.5 hours for the final flight evaluation. The pilot did not receive a final evaluation flight and was not awarded a completion certificate. The instructor pilot noted in his daily notes on September 8, 2006, "the pilot did not fly consistently to the performance standards. The pilot was behind the airplane and general finesse was lacking." The pilot's insurance company did not require a factory sign off. The pilots stated he received additional flight instruction after returning home from his flight instructor who attended the SR22 training with him.

Review of the pilot's logbook revealed he has 717 total hours not including 3 hour and 16 minutes on the accident flight. The pilot has recorded 501 total flight hours in the SR22 of which 14 hours has been flown in the last 90 days and 5 hours has been flown in the last 30 days. The pilot's last flight review and instrument proficiency check was conducted on June 25, 2005. The pilot's last recorded instrument flight was on June 26, 2006, and he has accumulated 51 hours of actual instrument flight time. The pilot has logged 92 hours of simulated instrument flight time. The pilot's last recorded flight was on October 18, 2006, in a Piper PA31. The pilot's last recorded flight in the SR22 before the accident flight was on October 4, 2006. The pilot's last recorded instrument approaches before the accident was on May 1, 2006, with a certified flight instructor.

Further review of the pilot's logbook revealed in the previous 12-month period before the accident, the pilot had logged 8.0 hours of actual instrument flight time, and 3.8 hours of simulated instrument flight time. The simulated instrument flight time included 1.8 hours with an instructor, and 2.0 hours of simulated instrument flight time as PIC, however, no safety pilot was noted in the remarks section of the logbook. In addition, the pilot had logged 7 instrument approaches. Six approaches were logged during 1.8 hours of simulated instrument flight with a flight instructor. The remaining approach did not indicate in the logbook if the pilot flew in instrument or simulated flight conditions. In addition, the logbook did not reflect the type of approach that was flown. Logbook entries revealed the pilot flew 3 solo instrument approaches. One approach was flown on July 2, 2003, January 25, 2005, and the last approach was flown on June 2, 2006. None of the flights indicated if the flights were flown in instrument or simulated instrument flight conditions, and the type of approach flown was not identified.

AIRCRAFT INFORMATION

Review of the Cirrus Design records revealed the pilot purchased the airplane from Cirrus Design on September 4, 2001. The last recorded annual inspection was conducted on July 14, 2006, at Hobbs time 577.4. The Hobbs time at the crash site was 598.3 hours. The airplane has flown 20.9 hours since the annual inspection. The altimeter, static pressure system, and transponder tests were completed on June 8, 2005. Examination of the gyro instruments revealed no anomalies. The airplane was topped off with 42.7 gallons of 100 low lead fuel at Landmark Aviation, North Palm Beach County General Airport, West Palm Beach, Florida, on October 27, 2006.

AERODROME INFORMATION

Review of the approach chart for the "ILS or LOC/DME RWY 28 Statesville Regional Airport (SVH)" revealed the minimums for the approach is decision height 1,166 feet, and 3/4 mile visibility. The airport elevation is 968 feet and the touchdown elevation is 966 feet. The weather at the time of the accident was 300 feet overcast with a visibility of 1 1/2 mile. The missed approach procedure requires the pilot to climb to 1,700 feet, followed by a climbing left turn to 3,400 feet on a heading of 080-degrees until intercepting the Charlotte 024 radial to PEGTE intersection and the Statesville 12.2 DME and hold. The minimums for the circling approach is decision height 1,420 feet and 1 mile visibility.

METEOROLOGICAL INFORMATION

The NWS Surface Analysis Chart at 1100 depicted the general synoptic conditions prior to the accident. The chart depicted a low-pressure system with a central sea level pressure of 998-hectopascal (hPa) over the Arkansas and Tennessee border, with an occluded front extending south-southeast through Tennessee to Mississippi, where the triple point was located. A cold front extended to the south-southwest from this point across Mississippi, eastern Louisiana, into the Gulf of Mexico. A warm front extended from the triple point, eastward across Mississippi, southern Alabama and Georgia, and then northeastward along the South Carolina coast. The accident site was located north of the warm front, and ahead or to the east of the occluded front in the cool air mass sector.

The regional NWS Surface Analysis Chart at 1100 depicted a warm front along the Georgia, and Carolina coasts. The station models across eastern Georgia, South Carolina, and western and central North Carolina, and eastern Tennessee indicated continuous light to moderate rain, fog, and overcast skies. The closest station model from Charlotte, North Carolina, to the south of the accident site indicated a wind from the east at 5 knots, continuous rain, overcast sky cover, temperature of 52-degrees Fahrenheit (F), dew point temperature of 50 degrees F.

The NWS regional radar mosaic chart at 1212 depicted a large area of echoes associated with rain showers extending over Georgia, North Carolina, South Carolina, Virginia, eastern Tennessee, and Kentucky.

The accident occurred at the Statesville Regional Airport (KSVH), at an elevation of 968 feet msl, located 9 miles north-northwest of Lake Norman Airpark. The airport was equipped with an Automated Weather Observation System (AWOS-3) and reported the following conditions surrounding the time of the accident:

KSVH 1201, automated observation was, wind from 040 degrees at 3 knots, visibility 1 1/4 miles in light rain, ceiling overcast at 300 feet, temperature and dew point 46-degrees F, and altimeter 30.01 inches of Mercury (Hg).

The Piedmont Triad International Airport, Greensboro, North Carolina, located 53 miles south west of Statesville wind profile indicated light surface winds, with winds from the south-southwest slowly veering to the west through 500-hPa with wind speeds increasing to 35 knots. The maximum wind was identified at below the tropopause at 43,750 feet with wind from 265 degrees at 117 knots. No strong vertical wind shears were identified below 18,000 feet.

The sounding data supported low stratiform clouds. No strong vertical wind shears were identified in the sounding.

The Geostationary Operations Environmental Satellite number 12 (GOES-12) data was obtained from the NOAA's Comprehensive Large Array-data Steward System (CLASS) and displayed on the National Transportation Safety Board's Man-computer Interactive Data Access System (McIDAS) workstation. The GOES-12 infrared and visible satellite imagery depicted an extensive area of stratiform clouds extending over the region. No cumulonimbus clouds or thunderstorms were identified in the vicinity of the accident site.

The closest NWS Weather Surveillance Radar-1988, Doppler (WSR-88D) was Roanoke, Virginia. The 1214 base reflectivity image depicted echoes ranging from 5 to 30 dbz or light intensity echoes extending over the region, with echoes of 5 to 10 dbz over the accident site.

The following pilot reports (PIREPs) were recorded over North Carolina surrounding the time of the accident. The reports are in standard format, but in narrative form, versus standard code and abbreviations. The reports are as follows:

Raleigh-Durham (RDU) routine pilot report (UA); Over - 35 miles southwest of RDU; Time - 0953; Flight level - 11,000 feet; Type aircraft - Boeing 737 airliner (B737); Weather - moderate rain; Turbulence - negative (smooth); Remarks - instrument meteorological conditions (IMC).

Greensboro (GSO) routine pilot report (UA); Over - 1 mile northeast of GSO; Time - 1201; Flight level - 400 feet; Type aircraft - British Aerospace (H25B) business jet; Remarks - cloud bases at 400 feet.

Raleigh-Durham (RDU) routine pilot report (UA); Over - Sand Hills (SDZ); Time - 1301; Flight level - 5,000 feet; Type aircraft - Cirrus (SR22) high performance single engine airplane; Temperature - 9 degrees C; Wind - 193 degrees at 17 knots; Icing - negative; Remarks - instrument meteorological conditions with a smooth ride.

Charlotte (CLT) routine pilot report (UA); Over - route between CLT to Knoxville, TN (TYS); Time - 1352; Flight level - 22,000 feet; type aircraft - Canadair Regional Jet (CRJ2) multiengine commuter aircraft; Icing - negative; Remarks - instrument meteorological conditions encountered the entire trip.

All the pilot reports were from pilots operating on IFR flight plans and indicated icing conditions above 13,000 feet, extensive cloud layers, with IMC conditions.

The NWS Aviation Weather Center (AWC) located in Kansas City, Missouri, issues the area forecasts at regular intervals and issues specials reports as necessary usually in the form of an AIRMET. The synoptic section of the forecast indicated that a strong low-pressure system was moving northeastward and was expected to be in central Kentucky by 2300. A warm front extended across southern Georgia was expected to lift northeastward into southern North Carolina and extreme northern South Carolina by 2300.

The forecast for the North Carolina Piedmont was for broken clouds at 5,000 feet msl, overcast at 10,000 feet, with tops to 25,000 feet, with occasional light rain developing. From 2300, overcast at 2,500 feet with visibility 3 to 5 miles in light rain and mist. From 1300, overcast clouds at 1,500 feet, visibility 3 to 5 miles in light to moderate rain and mist, with widely embedded thunderstorms developing with cumulonimbus cloud tops to 40,000 feet.

- The NWS had a full series of Airman's Meteorological Information (AIRMETs) issued at 0945 and current until 1600 for the region for IFR, mountain obscuration, turbulence, and icing conditions, and the accident site was located within the borders of these advisories.

AIRMET Sierra update 2 issued at 0945 for IFR and mountain obscuration conditions, valid until 1600. Occasional ceilings below 1,000 feet and/or visibility below 3 miles in precipitation

and mist, conditions. Mountains occasional obscured by clouds, precipitation, and mist, with conditions continuing beyond 2000 through 2200.

The closest Terminal Aerodrome Forecast (TAF) to the accident site was from Hickory Regional Airport (KHKY) located approximately 20 miles west of the accident site. However, no forecast was current when the pilot of N969ES obtained his preflight weather briefing. The forecast current at the time of the accident was issued at 1116 and was the fourth amendment from the initial 0749 issued forecast

The forecast for KHKY indicated from 1100, winds calm, visibility 2 miles in light rain and mist, ceiling broken at 900 feet, overcast at 2,800 feet, temporary conditions between 1100 and 1300 of visibility 3 miles in light rain and mist, scattered clouds at 800 feet, ceiling overcast at 2,500 feet. From 1300 through 2000, winds from 070 degrees at 8 knots, visibility 2 miles in moderate rain and mist, ceiling overcast at 400 feet.

The next closest TAF location was for Charlotte/Douglas International Airport (KCLT) located approximately 30 miles south of the accident site. The forecast available to the pilot of N969ES at the time of his filing his IFR flight plan was issued at 0127 and was for the following conditions:

From 1200, winds 070-degrees at 6 knots, visibility 5 statute miles, light rain and mist, ceiling overcast at 1,000 feet.

The next scheduled forecast was issued at 0713, with little change:

From 1100, winds 050-degrees at 5 knots, visibility better than 6 statute miles, in light rain, ceiling overcast at 2,500 feet.

From 1300, winds 060-degrees at 6 knots, visibility 5 statute miles, in light rain and mist, ceiling overcast at 1,200 feet.

A series of amendments were issued. The forecast at 0909 was:

From 1100, winds 050-degrees at 5 knots, visibility 5 statute miles, in light rain and mist, ceiling overcast at 1,200 feet.

From 1500, winds 070-degrees at 8 knots, visibility 2 statute miles, in moderate rain and mist, ceiling overcast at 400 feet.

The forecast at 1026 was:

From 1200, winds 070-degrees at 8 knots, visibility 2 statute miles, in moderate rain and mist, ceiling overcast at 400 feet.

The forecast at 1131 and current at the time of the accident was:

Issued at 1131, from 1200, winds 100-degrees at 5 knots, visibility 1 1/2 miles, in light rain and mist, ceiling overcast at 400 feet. Temporarily between 1200 to 1600, visibility 2 statute miles, ceiling overcast at 700 feet.

The pilot of N969ES filed an instrument flight plan and then obtained an abbreviated weather briefing from the St. Petersburg Automated Flight Service Station (AFSS) between 0649 and 0659. The pilot did not list an alternate airport.

The briefer used the Charlotte/Douglas International Airport (KCLT) terminal forecast (issued at 0127), which expected MVFR conditions until 1200, then IFR conditions with visibility 2 miles in moderate rain, with ceilings overcast at 500 feet. The pilot acknowledged the briefer and indicated "we should be down by noon, if nothing goes wrong and we should be good".

There were no reports of the pilot of N969ES getting any updates from the FAA's enroute flight advisory service (EFAS).

WRECKAGE INFORMATION

The main wreckage of the airplane was located in a wooded area adjacent to Statesville Regional Airport, Statesville, North Carolina, north of Aviation Drive in a ravine on an embankment. Examination of the crash site revealed the airplane collided with 75 foot tree tops in a nose down, left wing low attitude. The airplane continued through the trees on a heading of 116-degrees magnetic, and came to rest on a heading of 174-degrees magnetic at an elevation of 908 feet. The crash debris line was 166 feet long.

The upper and lower engine cowling separated from the airframe. The engine separated from the firewall and was located to the right in front of the right wing. The right aft engine mount leg and the left forward and aft engine mount legs were separated. The forward right engine mount assembly separated from the forward isolation mount. All engine accessories remained attached to the engine except for the oil cooler and the stand by generator. The nose landing gear wheel was separated from the nose gear assembly.

The propeller assembly remained attached to the propeller crankshaft flange. The propeller spinner was crushed and the propeller bulkhead was damaged. Rotational scratching was present on the spinner. All propeller blades remained attached to their propeller hubs. One propeller blade was bent forward at mid span and twisted. The outboard 2-inches of the propeller tip was curled forward toward the cambered side. Chord wise scratching was present on the cambered side of the propeller blade with 45-degree scratches. The outboard 10-inches of the propeller blade leading edge was polished. Another propeller blade outboard 10-inches of the propeller blade was twisted. The outboard 3-inches of the propeller blade had separated and was not located. Chord wise scarring was present on the trailing edge of the cambered side of the propeller blade, and 45-degree scratching was present at mid span on the propeller blade. The remaining propeller blade outboard 4-inches of the propeller blade tip was separated and twisting was present at the separation. Chord wise scarring and 45 degree scratching was present on the cambered side of the propeller blade.

The cabin area was intact from the firewall extending aft to the Cirrus Airframe Parachute System (CAPS) compartment. The windshield was broken out of the fuselage, the rear baggage compartment window, and right side window was broken. The left side cabin window was not damaged. The left baggage compartment door was locked. The cabin roof was cracked and compressed inward and outward on the right side of the fuselage. The right "a" pillar was separated. Both cabin doors were separated. Scarring was present on the right side of the cabin roof aft of the right cabin door extending rearward to the CAPS compartment. The CAPS strap covers were debonded from the left and right side of the fuselage.

The CAPS safety pin was located under the right front seat and the system had not been activated. Cirrus personnel cut the CAPS cable at the fuselage station bulkhead at the aft baggage compartment. Examination of the CAPS cover revealed no impact marks. The parachute enclosure was separated from CAPS bulkhead. The CAPS pick up collar was separated from the launch tube. The CAPS rocket motor flangeable mounting screws were severed. The CAPS rocket motor was displaced in the launch tube.

The aileron and roll trim system cable continuity was confirmed throughout the cabin floor aft to the rudder interconnect, and along the fuselage longerons to the kick out pulleys to the left and right aileron activation pulleys. The elevator cable continuity was confirmed from the control yoke to a pulley selector on the elevator torque tube, to a single cable to the forward pulley gang, through the elevator pulley gang to the elevator empennage bell crank. The rudder pedal cable continuity was confirmed from the rudder pedal torque tube to the forward pulley gang, to a single cable system routed under the cabin floor to the rudder interconnect, through the

elevator pulley gang to the rudder bell crank. The rudder activation pulley push pull rod was attached to the rudder bell crank and rudder.

The right wing was attached to the fuselage at the spar tunnel. The spar was fractured on its face from the right tip inboard 13 feet. The upper and lower right wing skins were debonded, fractured and separated. The right wing tip remained attached to a five-foot section of the right upper and lower wing skin. The flap was separated from all three-hinge points and was buckled downward at the mid hinge point. The flap actuator was extended 1-inch which indicates 100 percent flap extension. The flap switch in the cockpit indicated zero. The right aileron remained attached at the outboard and inboard hinge points. The right flap actuation arm was disengaged from the right actuation pulley. The right main fuel tank was ruptured and the fuel cap was intact with a tight seal. The right collector tank was ruptured. The right main landing gear remained attached to the wing.

The empennage was separated from the fuselage aft of the CAPS compartment. The horizontal stabilizer was fractured from the fuselage at the bond line. The right elevator separated at the outboard hinge point and the counter balance weight was attached. The left elevator remained attached to the horizontal stabilizer and the counter balance weight was attached. The rudder remained attached to the vertical stabilizer and the top of the rudder was bent to the right.

The left wing was attached to the fuselage at the spar tunnel. The spar was fractured on its face from the left tip inboard 4½ feet. The outboard 4 feet of the upper and lower wing skins were debonded, fractured, and separated. The left wing tip was separated and was located in a tree near the initial impact point. The leading edge of the left wing was damaged 2 feet outboard of the wing root and at the wing cuff. The flap was damaged at the midspan attachment point and remained attached at all hinge points. The left aileron was separated and the aileron actuation arm remained attached to the aileron. The left main fuel tank was ruptured and the fuel cap was intact with a tight seal. The left collector tank was ruptured. The left main landing gear remained attached to the wing.

Examination of the engine revealed the left and right engine exhaust tubes were damaged. The starter was damaged, and the starter adapter was intact and the mount was not damaged. The alternator was attached to the engine and damaged. The rear auxiliary generator was separated and damaged. The oil sump was damaged and leaking oil. The oil filter was removed, cut open, and no foreign objects were present. All cylinders were intact. Cylinders No. 1, No. 3, No. 5, and No. 4 received fin damage. The magnetos, fuel manifold valve, fuel injection lines, and fuel nozzles were intact and not damaged. The ignition harness was damaged.

The upper spark plugs were removed. The electrodes were "normal" when compared to the Champion Aviation Check-A- Plug Chart. Thumb compression and suction was obtained on all cylinders when the propeller flange was rotated by hand, and valve and gear train continuity was confirmed. The magneto to engine timing was checked and verified at 22 degrees before top dead center. The magnetos were turned by hand, spark was obtained at all ignition towers, and the impulse coupling snapped. The safety wire and lead seal was intact on the fuel manifold. The fuel manifold was removed, disassembled, and examined. The fuel manifold valve screen was free of debris, and fuel was present. The fuel manifold diaphragm and spring were intact and not damaged. The engine driven fuel pump was damaged, and fuel was present in the fuel to the fuel control body unit. The fuel pump drive coupling was intact, and the fuel pump drive shaft rotated freely by hand. The propeller governor was removed and was not damaged. The propeller governor drive shaft rotated freely. The propeller governor mounting gasket screen was removed and no debris was present. The fuel control throttle plate shaft was damaged. The throttle plate moved freely by hand and fuel was present in all fuel lines. The fuel injector nozzles were removed and were free of contaminants.

MEDICAL AND PATHOLOGICAL INFORMATION

The pilot and one passenger were transported to Baptist Hospital in Winston Salem, North Carolina, with serious injuries. No toxicology testing was ordered by the North Carolina Highway Patrol on the pilot. A subpoena was issued on November 30, 2006, by the NTSB to Wake Forrest University Baptist Medical Center, Winston-Salem, North Carolina, for any and all blood and urine samples taken from the pilot. The Forensic Toxicology Research Section, Federal Aviation Administration, Oklahoma City, Oklahoma performed testing on the specimens received from Wake Forrest University Baptist Medical Center. Carbon monoxide, cyanide, and ethanol testing was not performed. The results were negative for basic, acidic, and neutral drugs.

The Piedmont Pathology Association, Medical Examiner, Hickory, North Carolina, issued a certificate of death on the two passengers on October 27, 2006. The cause of death was "multiple trauma." No toxicological samples were requested.

ADDITIONAL INFORMATION

The FAA conducted a flight check of the Statesville Regional Airport ILS runway 28 on October 28, 2006, and the instrument landing system was found within tolerance.

Review of the Cirrus Design, Normal Checklist states on page N9, "BALKED LANDING/GO AROUND" requires the pilot to set the flaps at 50 percent, airspeed between 75 to 80 KIAS until clear of obstacles, and then raise the flaps to 0 percent. The flaps at the crash site were at 100 percent.

Review of the Cirrus Pilot Operating Handbook, Section V, Stall Speeds, page 5-16, figure 5-7 indicates at an operating weight of 3,400 pounds, flaps down; the airplane will stall at 59 KIAS or KCAS.

The pilot's logbook was released to the custody of the registered owners attorney on November 7, 2006. The airplane logbooks were released to the custody of the registered owners attorney on November 15, 2006. The airplane and gyro instruments retained by the NTSB were released to Atlanta Air Recovery on January 7, 2007.

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Critical Decision Making Seminars

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NTSB Identification: LAX07FA021

14 CFR Part 91: General Aviation

Accident occurred Wednesday, October 25, 2006 in Meadview, AZ

Aircraft: Cirrus SR22, registration: N121LD

Injuries: 4 Fatal.

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed.

On October 25, 2006, at 1208 mountain standard time, a Cirrus SR22, N121LD, reported icing conditions at 13,000 feet mean sea level (msl), disappeared from radar, and then impacted terrain about 24 nautical miles northeast of Meadview, Arizona. The pilot was operating the airplane under the provisions of 14 Code of Federal Regulations Part 91. The instrument rated private pilot and three passengers sustained fatal injuries and the airplane was destroyed. A combination of visual and meteorological conditions prevailed along the route of flight and the airplane was being operated under an instrument flight rules (IFR) clearance. The pilot departed from Lake Tahoe Airport, South Lake Tahoe, California, about 1030 Pacific daylight time, and was destined for the Grand Canyon National Park Airport, Grand Canyon, Arizona.

According to a family friend, the pilot met his wife and two children in the San Francisco area on October 23. On October 24, they flew to South Lake Tahoe where they spent the night. On October 25, the day of the accident, the pilot planned to fly to the Grand Canyon where he and his family would go hiking.

The airplane was last refueled at a fixed base operator at the Reno/Tahoe International Airport, Reno, Nevada, on October 23. The fueling invoice indicated that the right and left fuel tanks were topped off with the addition of 24.1 gallons of fuel. On the invoice, the pilot's estimated departure time from the airport was noted as 1000 on October 24.

A fixed base operator employee at Lake Tahoe Airport stated that the pilot arrived at the airport on October 24, from Reno. The airplane was secured to the ramp and no fueling services were provided. The pilot returned to the airport the following morning and found frost on the airplane. He and his family waited while the sun rose and melted the frost accumulation. They departed about 1030.

The National Transportation Safety Board investigator-in-charge, an Safety Board specialist from the Office of Research and Engineering, two Federal Aviation Administration (FAA) inspectors from the Las Vegas Flight Standards District Office (FSDO), and one investigator from FAA Aircraft Accident Investigation responded to the accident site on October 26, 2007. Additional investigative personnel from Cirrus Design Corporation, Ballistic Recovery Systems (BRS), AmSafe Aviation, and Teledyne Continental Motors, who were parties to the investigation, responded to the site to assist.

The airplane impacted sloped desert terrain at an elevation of approximately 4,520 feet msl on a westerly heading. All of the flight control surfaces were attached or partially attached to the structure. There was no fire. The wreckage was generally confined to the impact area, and except for the area immediately surrounding the wreckage, minimal ground scarring was observed.

The Cirrus Airframe Parachute System (CAPS) was examined. The parachute was out of its

N901CD 20020528

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housing, draped over the empennage and aft fuselage section of the airframe. Some of the gores (panels that make up the canopy of the parachute) remained folded. The suspension lines were intact and undamaged. The deployment cable was continuous from the cockpit handle aft through the fuselage to the rocket housing area. The rocket and the deployment bag cover were located approximately 288 feet east of the accident site.

Based on preliminary weather information obtained by a Safety Board meteorologist, local weather included AIRMETS (Airman's Meteorological Information) for icing (approximately 65 nautical miles northeast of the accident site) and moderate turbulence (within the accident site area). In addition, a convective SIGMET (Significant Meteorological Information) was issued for an area encompassing the accident site. A convective SIGMET implies severe or greater turbulence, severe icing, and low-level wind shear.

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DCA07MA003

On October 11, 2006, about 1442 eastern daylight time, a Cirrus Design SR20, N929CD, operated as a personal flight, crashed into an apartment building in Manhattan, New York City, while attempting to maneuver above the East River. The two pilots on board the airplane, a certificated private pilot who was the owner of the airplane and a passenger who was a certificated commercial pilot with a flight instructor certificate, were killed. One person on the ground sustained serious injuries, two people on the ground sustained minor injuries, and the airplane was destroyed by impact forces and postcrash fire. The flight was operating under the provisions of 14 Code of Federal Regulations (CFR) Part 91, and no flight plan was filed. Marginal visual flight rules (MVFR) conditions prevailed at the time of the accident.

The accident airplane departed Teterboro Airport (TEB), Teterboro, New Jersey, about 1429 and was cleared for a visual flight rules (VFR) departure. According to air traffic control (ATC) transcripts, the pilots acknowledged that they were to stay out of the New York class B airspace. After takeoff, the accident airplane turned southeast and climbed to an altitude of about 600 to 800 feet. When the flight reached the western shore of the Hudson River, it turned to the south, remaining over the river, then descended to 500 feet. The flight continued southbound over the Hudson River until abeam of the southern tip of Manhattan, at which point, the flight turned southwest bound. Radar data from John F. Kennedy International Airport (JFK), Jamaica, New York; Newark International Airport (EWR), Newark, New Jersey; and Westchester County Airport (HPN), White Plains, New York, indicated that the accident airplane's altitude varied from 500 to 700 feet for the remainder of the flight.

About 1436, the airplane flew around the Statue of Liberty then headed to the northeast, at which point, it proceeded to fly over the East River. About 1 mile north of the Queensboro Bridge, the airplane made a left turn to reverse its course. Radar contact was lost about 1442. The airplane impacted a 520-foot tall apartment building at 524 East 72nd Street, 333 feet above street level.

[The Safety Board's full brief is available at <http://ntsb.gov/Publictn/pubictn.htm>. The Aviation Accident Brief number is NTSB/AAB-07/02]

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DEN06FA131

HISTORY OF FLIGHT

On September 15, 2006, at 1332 mountain daylight time, a Cirrus Design Corp SR20, N787SL, owned by East End Aviation LLC, and piloted by a private pilot, was destroyed when it impacted terrain 50 nautical miles (nm) north northwest of Maybell, Colorado. Visual meteorological conditions prevailed at the time of the accident. The personal flight was being conducted under the provisions of Title 14 Code of Federal Regulations Part 91 on an instrument flight rules flight (IFR) plan. The private pilot and private pilot rated passenger were fatally injured. The cross-country flight departed Bolinder Field - Tooele Valley Airport (TVY), Tooele, Utah, approximately 1150 and was en route to Lincoln, Nebraska (LNK).

The pilot and his passenger were returning from a business meeting in California and had departed Metropolitan Oakland International Airport (OAK) approximately 0640 Pacific daylight time. A flight log found within the wreckage indicated that they landed at TVY. According to a receipt from Tooele Valley Airport, the passenger paid for 36.26 gallons of fuel at 1120.

At 1221:13, the pilot contacted Cedar City radio with a request to file an IFR flight plan from his present position (10 miles east of FFU VOR) to LNK. The flight plan was filed for 14,000 feet. Afterwards, the briefer mentioned Airman's Meteorological Information (AIRMETS) along the route of flight for mountain obscuration, turbulence, and icing, and advised them to contact Flight Watch if they needed further weather information.

At 1320:20, the pilot reported to Denver (DEN) Air Route Traffic Control Center (ARTCC) that they were at 13,800 feet and "need a (unintelligible) altitude… [they] picked a little bit of ice." The controller issued an altimeter setting of 29.65. At 1323:29, the controller asked about the flight's assigned altitude. The pilot responded 14,000 feet and stated that he was unable to maintain that altitude. Several altitude assignments were issued by the controller and ultimately a block altitude from 12,000 feet to 13,000 feet was assigned.

At 1330:51, the pilot reported to ARTCC that they were having "serious" icing issues and were unable to maintain 12,000 feet. The controller asked the pilot if he had terrain in sight and the pilot responded in the affirmative. The controller cleared the pilot to descend to 11,000 feet and maintain his own terrain separation. At 1331:57, the controller asked the pilot what type of icing he was encountering. No further transmissions were received from the pilot.

National Track Analysis Program (NTAP) radar data depicted the airplane on a northeasterly heading at an encoded altitude of 12,500 feet mean sea level (msl). At 1329:40, the airplane reversed course to a northerly direction and continued to descend. Radar contact was lost at 1332:13. No encoded altitude was available for this time stamp.

An Alert Notification (ALNOT) was issued at 1349 and search and rescue operations were initiated. The wreckage and debris path were located approximately 1440 by law enforcement personnel from the Sweetwater County Sheriff's office. A witness in the area observed a portion of the fuselage being drug by the aircraft recovery parachute. They did not witness the actual impact.

PERSONNEL INFORMATION

N901CD 20020528

The pilot, age 48, held a private pilot certificate with airplane single and multi-engine land, and instrument ratings, initially issued on October 30, 2004. He had been issued a second class airman medical certificate on May 24, 2006. The certificate contained no limitations.

N837CD 20020424

According to the Cirrus Factory Training Course records, the pilot attended aircraft familiarization training from September 16 through September 19, 2005. The pilot logged 12.2 hours of flight training and 8.0 hours of ground school during this time. All areas of training were completed with a satisfactory rating.

N893MK 20020123

A copy of the pilot's logbook was provided to the National Transportation Safety Board (Safety Board) investigator-in-charge (IIC) for review. The pilot had logged no less than 583.6 hours; 88.3 in multi-engine airplanes and 495.3 hours in single engine airplanes. A total of 275.8 hours had been logged in a Cirrus SR-20, all but 1.2 hours of which were in the accident airplane. In addition, the pilot had logged 95.8 hours of instrument time; 35.7 of which were in actual instrument conditions, and 28 hours of which were in the accident airplane. The pilot successfully completed the requirements of a Flight Review on July 4, 2005.

N116CD 20010410

The passenger, age 46, held a private pilot certificate with an airplane single engine land rating which was issued on May 2, 2005. He had been issued a third class airman medical certificate on September 10, 2003. The certificate contained no limitations.

According to a flight log located within the wreckage, the passenger had flown the previous leg from California. There was no record that the passenger had attended the Cirrus Factory Training Course.

AIRCRAFT INFORMATION

The accident airplane, a Cirrus Design Corp (serial number 1556), was manufactured in 2005. It was registered with the FAA on a standard airworthiness certificate for normal operations. The airplane was equipped with a Teledyne Continental Motors IO-360-ES engine rated at 210 horsepower at 2,800 rpm. The engine was equipped with a Hartzell 2-blade, constant speed propeller.

The pilot purchased the airplane in September of 2005. The airplane was registered to and operated by East End Aviation, LLC., and was maintained under an annual inspection program. A review of the maintenance records indicated that a 100-hour inspection had been completed on April 4, 2006, at an airframe total time of 259.9 hours. The airplane had flown approximately 243.5 hours between the last inspection and the accident and had a total airframe time of 503.4 hours.

METEOROLOGICAL CONDITIONS

On September 15, 2006, a Surface Analysis chart, prepared by the National Weather Service (NWS), National Center for Environmental Prediction, depicted a stationary front that extended from a low pressure area, located in southwest North Dakota, diagonally through Wyoming and into northern Utah and Nevada. A high pressure ridge extended from western Colorado into northern New Mexico. The accident site was located to the south of the stationary front and near the ridge of high pressure.

The NWS Freezing Level chart issued on the day of the accident depicted the freezing level along the route of flight ranging from 11,600 feet to 14,200 feet msl. Doppler weather radar (approximately 120 miles south-southeast of the accident location) scanned the accident area at 1322. Data indicated reflectivity values of 25 to 34 dBz, or moderate intensity precipitation, in the accident area around the accident time. According to NTAP data, the accident airplane was in the immediate vicinity of a 35 dBz cell when the pilot first reported icing conditions.

An Aviation area forecast was issued for eastern Utah, southern Wyoming, and northern Colorado by the Aviation Weather Center (AWC) in Kansas City, Missouri, the day of the

accident, at 0445. The forecast for the route from Utah into Colorado and Wyoming was for scattered to broken clouds at 10,000 feet, broken to overcast clouds at 15,000 feet, southerly winds gusting to 30 knots, widely scattered light rain showers with scattered thunderstorms, and rain showers, thunderstorms possibly severe, cumulonimbus cloud tops to 40,000 feet.

Multiple pilot reports (PIREPS) had been issued for the Colorado/Wyoming area regarding icing. Reports given for icing included light to moderate clear and rime icing from 8,500 feet msl to 19,000 feet msl. The NWS Current Icing Potential chart valid at the time of the accident depicted a 90 percent chance of icing conditions at 14,000 feet, 70 percent chance of icing conditions at 13,000 feet, and less than 40 percent chance of icing below 12,000 feet, all in the vicinity of the route of flight.

AIRMETs for mountain obscuration (SIERRA), turbulence (TANGO), and icing (ZULU) were all issued by AWC for areas in Utah, Colorado, and Wyoming, including the accident airplane's route of flight. AIRMET SIERRA stated to expect mountains occasionally obscured by clouds, precipitation, mist, and fog. AIRMET TANGO stated to expect occasional moderate turbulence below flight level (FL) 180. AIRMET ZULU stated to expect occasional moderate rime and mixed icing between the freezing level and FL 260. Convective Significant Meteorological Information (SIGMET) 34W was issued for Wyoming, Colorado, and Utah for an intensifying area of thunderstorm moving northeastward at 35 knots with tops to 38,000 feet. The NWS Severe Storm Prediction Center also issued a Weather Watch number 766 for the potential for severe thunderstorms. The watch area extended over the flight route from Utah to the accident site.

The closest official weather observation station was Rock Springs, Wyoming (RKS), located 50 nautical miles (nm) north of the accident site. The elevation of the weather observation station was 6,760 feet msl. The routine aviation weather report (METAR) for RKS, issued at 1254, reported, winds 180 degrees at 24 knots, gusting to 29 knots; visibility 10 statute miles; sky condition clear; temperature 15 degrees Celsius (C); dewpoint 7 degrees C; altimeter 29.65 inches.

The METAR for RKS, issued at 1354, reported, winds 170 degrees at 23 knots, gusting to 28 knots; visibility 10 statute miles; sky condition, ceiling broken a 7,500 feet; temperature 15 degrees C; dewpoint 6 degrees C; altimeter 29.64 inches; remarks, peak wind from 190 degrees at 31 knots measured at 1341; lightning distant west and northwest.

The METAR for Vernal, Utah, issued at 1312, reported, winds 260 degrees at 9 knots, gusting to 18 knots; visibility 2 ½ miles in thunderstorm and heavy rain; sky condition, few clouds at 2,800 feet, ceiling broken at 4,900 feet, overcast at 7,000 feet; temperature 10 degrees C; dewpoint 6 degrees C; altimeter 29.69 inches. Remarks: peak wind from 310 degrees at 29 knots recorded at 1301, wind shift at 1255, lightning distant all quadrants, and rain began at 1304.

FLIGHT RECORDERS

The accident airplane was equipped with an Avidyne Primary Flight Display (PFD) (part number 700-0004-0008) and an Avidyne Multi-Function Display (MFD) (part number 700-0006-000). The avionics computing resource from the PFD and the flash memory device from the MFD were removed and sent to Avidyne for extraction of flight data associated with this accident. The information was downloaded on September 25, 2006, under the auspices of the NTSB.

The PFD contained seven fault codes and no flight parameters. The first two fault codes were not related to this event. An "Attitude Heading Reference System (AHRS) invalid" message was recorded at 1931:48 Universal Time Coordinated (UTC). According to Avidyne, this message could indicate any of the following conditions - the value of the calculated pitch, roll, magnetic heading, or rate of turn is considered invalid, or the AHRS has ceased sending data

for one second. A cluster of four fault codes was recorded at 1932:12. According to Avidyne, these fault codes were consistent with a loss of power to the unit.

The MFD was capable of receiving XM satellite weather information. The MFD does not store the weather information; however, the message type and time received is stored in the Compact Flash Card. No engine or other parameters were recorded.

WRECKAGE AND IMPACT INFORMATION

The National Transportation Safety Board investigator-in-charge (IIC) arrived on scene approximately 1400 on September 16, 2006. The accident site was located in uneven terrain vegetated with sagebrush. Several ravines and gullies were located between the initial impact point and the last portion of the airplane wreckage. A global positioning system (GPS) receiver recorded the coordinates of the initial impact point as 40 degrees, 59 minutes, 04.9 seconds north latitude, and 108 degrees, 48 minutes, 00.2 seconds west longitude. A GPS receiver recorded the coordinates of the last portion of the airplane wreckage as 41 degrees, 00 minutes, 16.6 seconds north latitude, and 108 degrees, 47 minutes, 11.7 seconds west longitude. The accident site elevation varied from 7,120 feet to 6,900 feet msl and the airplane impacted on a magnetic heading of 015 degrees.

The Safety Board IIC identified the initial impact point 1.07 miles south of the Colorado/Wyoming border. Fragments from the nose wheel pant were located within the north most portion of the ground scar. A debris path extended, in a north-northeast direction from the initial point of impact, for 500 feet. The engine cowling, fuselage doors, main landing gear assemblies, the propeller assembly, various engine components, the Kevlar Cirrus Airframe Parachute System (CAPS) strap covers, fragmented composite material, and various personal effects were located within the initial debris path.

A periodic ground scar and debris path extended from this point, across rough uneven terrain, down a 100-foot embankment, to the wing assembly. The ground scars varied in length and width and were consistent with an object being drug. Sagebrush was bent and crushed in a north-northwesterly direction. The CAPS deployment system (including the rocket housing, and parachute cover), the CAPS fuselage cover, the engine assembly, the right aileron, and various personal effects were located within the second debris path.

The wing assembly was located 1,542 feet from the initial impact point at an elevation of 7,072 feet msl. It consisted of both the left and right wing, both flaps, the right aileron, both front seats, and portions of the instrument panel. The leading edges of both wings were crushed aft and exhibited broken composite material. The trailing edges of both flaps were wrinkled and the aileron separated from the right wing. The leading edges of both wings were clean and the airfoil just aft of both leading edges exhibited aft particle streaking consistent with structural icing. Control continuity to both ailerons was confirmed.

A periodic ground scar and debris path extended from the wing assembly over rough, uneven terrain, across several gullies and ravines, over several barbed wire fences, and across highway 430, into the state of Wyoming. Portions of the elevator, rudder, and horizontal stabilizer were located within the debris path. An 8.5-foot section of the aft fuselage and portions of the empennage came to rest 1.55 miles north northwest of the initial impact point. The CAPS canopy remained partially attached to the fuselage and was tangled in a barbed wire fence.

The CAPS activation handle, the rudder pedals, the rudder and elevator control cables, and an aft seat remained with this portion of the fuselage. The CAPS activation handle was in the stowed position. An on scene examination of the handle revealed mud impacted within the securing pinhole and around the handle groove. The safety pin was not located. Control cable continuity was established through the rudder and elevator cables.

MEDICAL AND PATHOLOGICAL INFORMATION

The autopsy was performed on the pilot and passenger in the Jefferson County Coroner's office on September 20, 2006, as requested by the Moffett County Coroner's office. The autopsy revealed the cause of death for the pilot due to "head and internal injuries secondary to blunt force trauma sustained in the airplane crash." The cause of death for the passenger was due to "exsanguination secondary to lacerations involving the heart and aorta secondary to blunt force trauma sustained in the airplane crash."

During the autopsy, specimens were collected for toxicological testing to be performed by the FAA's Civil Aerospace Medical Institute (CAMI), Oklahoma City, Oklahoma (CAMI Reference #200600218001 and 200600218002). Tests for carbon monoxide, cyanide, ethanol, and drugs were all negative.

TESTS AND RESEARCH

The airplane wreckage was recovered on September 17, 2006, and relocated to a hangar in Greeley, Colorado, for further examination. The Safety Board IIC, Safety Board survival factors investigators, the FAA AAI-100 IIC, and representatives from Am Safe Aviation, and Teledyne Continental Motors, examined the wreckage on September 19, 2006. The Safety Board IIC and a representative from Ballistic Recovery Systems (BRS) examined portions of the wreckage on September 21, 2006.

Engine and Propeller

The engine was separated from the airframe. Three of the four engine mounts remained attached to the engine assembly. The top sparkplugs were removed and exhibited normal signs of wear. The cylinders were examined using a lighted borescope and exhibited normal operational signatures. The engine was rotated through using an accessory drive tool from the mount pad on the back of the starter adapter. Engine continuity was established from the rear of the engine to the front. Tactile compression was confirmed on all six cylinders. The left magneto was rotated through by hand, producing spark on all of the leads. The right magneto was rotated, with the use of a magneto test bench, resulting in a spark on all of the leads.

The propeller assembly, to include both blades and the spinner, separated from the engine just aft of the crankshaft propeller flange. The propeller blades were arbitrarily labeled A and B for identification purposes only. Both blades exhibited chordwise scratching and leading edge polishing. The spinner was crushed aft, exhibiting rotational signatures.

Seats and Seat Restraints

The Cirrus SR20 is equipped with dynamically certified seats per CFR 23.562. The seat bottoms have an integral aluminum honeycomb core, designed to crush at impact to absorb downward loads. The seat back of the left seat was pushed aft. The forward half of the aluminum honeycomb core was crushed. The seat back of the right seat was found bent forward. The forward two thirds of the aluminum honeycomb core were crushed. The crushing on both cores initiated centrally and the degree of crushing increased towards the forward portion of the core. According to Cirrus, this crushing is consistent with a forward motion during impact as opposed to a vertical impact.

The two front seats were equipped with a 4-point harness and an airbag. The left seat harness was found buckled and taught around the seat. The airbag was deployed. The right seat harness was not buckled and the airbag was deployed. The inertia reels were fully functional.

Cirrus Airframe Parachute System

The CAPS was examined by a representative from BRS under the auspices of the Safety Board IIC. The aluminum inspection panel mounted on the airframe, forward of the CAPS unit,

exhibited oil canning and was covered in dry mud. The panel was removed, revealing an 8-inch witness mark that initiated 2.5 inches from the top of the panel and extended down diagonally. The mark was consistent with the fiberglass cover that housed the igniter. The panel also exhibited burn marks at the top.

The two primers located at the end of the igniter assembly displayed a circular indentation at the center of each primer, consistent with impact from the respective firing pins. The ball bearings within the igniter assembly were not present. The CAPS rocket powder was fully spent which is consistent with deployment by tension in the cable. The Teflon covered stainless steel lines attached to the rocket pick-up collar exhibited discoloration of the Teflon. The CAPS fuselage cover exhibited a slight impact witness mark with a corresponding spider like paint fracture on the opposite side. This mark is consistent with impact from the rocket as it exits the airplane.

ADDITIONAL INFORMATION

According to the Cirrus SR 20 Pilot Operating Handbook (POH), Section 2: Limitations - "Flight into known icing conditions is prohibited." In the event that icing is inadvertently encountered the POH states to activate the pitot and cabin heat, and the alternate induction air, and either reverse direction of flight or change altitude in order to exit icing conditions.

The POH states "the Cirrus Airframe Parachute System (CAPS) should be activated in the event of a life-threatening emergency where CAPS deployment is determined to be safer than continued flight and landing." According to the POH, these scenarios include mid-air collision, structural failure, loss of control, and landing in inhospitable terrain. Loss of control, according to the POH, "may result from many situations, such as: a control system failure (disconnected or jammed controls); severe wake turbulence, severe turbulence causing upset, severe airframe icing, or sustained pilot disorientation caused by vertigo or panic; or a spiral/ spin." According to the POH, "No minimum altitude for deployment has been set." The POH goes on to state, "it might be useful to keep 2,000 feet AGL in mind as a cut-off decision altitude."

According to the POH, the CAPS is activated by pulling on the T-handle, installed on the cabin ceiling on the airplane centerline, just above the pilot's right shoulder. The POH states that both hands should be used with a straight "downward" continuous force to activate the CAPS. "Up to 45.0 pounds (20.4 Kg) force, or greater, may be required to activate the rocket."

Finally, the POH states "if it is known or suspected that ground gusts of approximately 30 knots or more are present in the landing zone, there is a possibility that the parachute could drag the airplane after touchdown, especially if the terrain is flat and without obstacles."

The wreckage was released to a representative of the insurance company on February 14, 2007.

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NTSB Identification: CHI06FA245

14 CFR Part 91: General Aviation

Accident occurred Monday, August 28, 2006 in Indianapolis, IN

Aircraft: Cirrus SR-22, registration: N91MB

Injuries: 1 Fatal, 3 Serious.

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed.

On August 28, 2006, at 1038 eastern daylight time, a Cirrus SR-22, N91MB, was destroyed when it impacted a water retention pond located about 2.4 miles from the Eagle Creek Airpark (EYE), Indianapolis, Indiana, after a loss of control during cruise climb. The 14 Code of Regulations Part 91 personal flight departed EYE at 1034 en route to Hilton Head Airport (HXD), Hilton Head Island, South Carolina. The pilot received fatal injuries, and the three passengers received serious injuries. Instrument meteorological conditions prevailed at the time of the accident. The flight was on an instrument flight plan.

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N889JB 20050115

N1159C 20041204

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N100BR 20031012

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CHI06FA186

HISTORY OF FLIGHT

On July 11, 2006, at 0943 eastern daylight time, a Cirrus SR-22, N8163Q, was destroyed when it impacted a tree and terrain during a go-around after an attempted landing on runway 30 (2,500 feet by 48 feet, asphalt) at the Lee Airport (ANP), Edgewater, Maryland. The private pilot initially survived the accident and was taken to a hospital, but died about three weeks later as a result of the injuries sustained during the accident. The 14 Code of Federal Regulations Part 91 personal flight departed the Ocean City Municipal Airport (26N), Ocean City, New Jersey, at 0900 with ANP as the final destination. Visual meteorological conditions prevailed at the time of the accident. An instrument flight rules (IFR) flight plan had been filed.

The route of flight on the IFR flight plan was: SIE, ENO, V268, BAL. The proposed time en route was 45 minutes at a speed of 165 knots with an en route altitude of 4,000 feet mean sea level (msl).

A witness reported that he observed the airplane enter the airport's landing pattern by entering a 45-degree entry from the northeast. The witness reported that the airplane crossed runway 30 about mid-field and entered a left downwind leg for landing on runway 30.

Another witness, who was standing on the ramp of the maintenance hangar at ANP, reported that he heard the pilot make a radio call over the airport's Unicom frequency stating that he was landing on runway 30. The witness reported that he observed the airplane over the approach end of the runway at an altitude of 150 - 175 feet above ground level (agl). He reported that the airplane was "diving for the runway" and was flying on the left side of the runway over the grass between the taxiway and the runway. The airplane continued to "dive" until it was about one half way down the runway when the nose of the airplane leveled out at an altitude of about 75 feet agl. He heard the engine noise increase, but not to full power. He reported that the airplane "banked hard to the left" and that he could see the top of both wings. He lost sight of the airplane behind a line of trees, and later heard a "thud" followed by another thud.

The same witness reported that the airplane's engine sounded normal with no backfiring or sputtering. He heard a slight increase of engine power when the nose of the airplane leveled out. He reported that the flaps were partially extended.

A third witness, who was working in his hangar located about mid-field at the airport, reported that he heard the airplane when it was over the runway. He reported that the airplane sounded like it was "not developing a lot of power" but was "coasting." Then the airplane powered up "a little bit" and then turned to the left. The witness reported that he did not see the airplane after the turn, but he heard the engine "miss" or "stop" when it was over the neighborhood. The witness ran to the accident site when he heard the crash.

Two construction workers, who were working on a house on Lee's Lane which was located about 1/8 of a mile from the accident site, reported that they heard the airplane as it flew over the house. They described the engine noise as being "extremely loud" prior to the sound of the airplane impacting the trees.

Numerous witnesses arrived at the accident site located about 100 yards from the third

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witness's hangar. Fuel was spilling from both fuel tanks. They removed the seat belt and shoulder harness from the pilot and pulled him from the airplane. An emergency medical helicopter arrived at the scene and the pilot was flown to a hospital.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with single-engine land and instrument ratings. He held a third-class medical certificate with the following restriction: "Must wear corrective lenses for near and distant vision." The pilot had a total of 2,746 flight hours. The pilot had received 9.5 hours of initial flight training in the Cirrus SR-22 in April 2004, through the Cirrus Design flight-training program in Duluth, Minnesota. He had a total of 167 hours in the SR-22.

AIRCRAFT INFORMATION

The airplane was a Cirrus SR-22, serial number 785, manufactured in 2003. The airplane seated four and had a maximum gross weight of 3,400 pounds. The engine was a 310 horsepower Continental IO-550-N engine. The airplane had an annual maintenance inspection conducted on May 1, 2006. The airplane had flown approximately 3.8 hours since the last inspection and had a total time of 391 hours.

METEOROLOGICAL CONDITIONS

At 0954, the observed surface weather at BWI, located about 14 nautical miles north northwest of ANP, was: winds 220 degrees at 7 kts, visibility 4 statute miles, haze, temperature 28 degrees Celsius (C), dew point 22 degrees C, altimeter 30.11 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted an oak tree about 75 feet in height that was located in a residential neighborhood that bordered the airport property. The airplane wreckage was found in a soybean field that was on the airport property. The coordinates of the main wreckage were 38 degrees 56.537 minutes north longitude and 076 degrees 34.227 minutes west latitude. There was no ground fire.

The oak tree exhibited strikes at the top of the tree and three large tree limbs were knocked down in a northerly direction. The same oak tree also had tree limbs that did not exhibit any damage located to the right and left of the three large limbs that were knocked down. The airplane's initial point of impact on the ground was about 30 feet from the oak tree on a magnetic heading of 060 degrees. The descent angle from the oak tree to the initial impact point was about 35 - 40 degrees.

Numerous branches were in the wreckage path between the oak tree and the main wreckage. The initial ground impact point exhibited a slash through the black dirt that was about 56 inches wide and was consistent with a propeller strike. There was a depression in the ground that was about 5 feet in length at the initial impact point going toward the main wreckage.

The main wreckage was located about 65 feet from the oak tree. The longitudinal axis of the wreckage was on a 240 magnetic heading. The engine was found on the right wing of the aircraft next to the cabin, facing aft. The engine remained attached to the firewall via control cables and hoses. The nose landing gear was separated from the fuselage and was found near the main wreckage.

The belly and floor of the cockpit forward of the spar tunnel were pushed upwards. The firewall and cockpit instrument panel were pushed back into the cockpit and were over both front seat bottom cushions. The pilot's seatbelt was found open but intact. The flap switch was found in the 100% (full down) setting. The fuel selector was set to the right tank.

The left inboard wing section remained attached to the fuselage and exhibited forward edge

buckling. The wing root area from the fuselage outboard to the fresh air inlet was missing pieces of wing skin. The hole left by the missing pieces of skin contained tree leaves consistent with the trees the aircraft struck during the impact sequence. The main spar exhibited multiple delaminations along its length. The left flap was separated from one of its hinge points. The left flap outward of the mid-span hinge buckled in two places and was bent upward. The inboard trailing edge of the flap was buckled forward. A measurement was taken from the inboard side of the left flap from the forward side of the anti-scoff tape to the wing cove. The distance measured was approximately 4 inches. The left main landing gear remained attached to the left wing, but was bent to the left.

The outboard section of the left wing was broken off during the impact sequence at approximately wing station (WS) 132. The outboard section of the left wing, which included about a 3-foot section of wing, the left aileron, the left wingtip, and the left strobe, were found in the residential yards that were located south of the oak tree.

The right inboard wing remained attached to the fuselage and exhibited forward edge buckling and had large jagged cuts with missing sections of wing skin. The main spar exhibited multiple delaminations along its length. The flap on the right wing separated from two of its three hinge points. The flap was torn and dented along the leading edge with a large upward buckle just outboard of the mid-span hinge. The outboard section of the right wing was broken at wing station (WS) 132, but it remained attached to the wing and was found with the main wreckage. The right wingtip was found with the main wreckage. The right main landing gear was separated from the right wing and was found with the main wreckage. It exhibited bending to the left.

The empennage separated from the fuselage just forward of the fuselage station (FS) 289 bulkhead, but it remained attached by the rudder and elevator cables. The horizontal stabilizer was found mostly intact. Both elevators showed impact damage. The damage to the right elevator was concentrated at the tip. The elevator buckled at the outboard end. The left elevator showed buckling on the trailing edge side in two places. The left elevator could not be moved up or downward from having been forced forward into the horizontal stabilizer. The vertical stabilizer had damage to the leading edge on the topside of the empennage. The rudder separated from the vertical stabilizer and was found lying across the left horizontal stabilizer.

Flight control cable continuity was checked. All cables were traced from the flight controls to their respective attach points on the flight control surfaces. There were no cable breaks to any of the flight control cables.

The roll and pitch trim actuators were found in approximately the neutral setting. The flap actuator arm had sheared from the motor housing of the flap actuator but remained attached to the flap torque tube assembly. The flap actuator arm protruded approximately 1/4 inch from its housing which is consistent with a flap setting of 100% (full down).

The Cirrus Airframe Parachute System (CAPS) system was found un-deployed. The parachute enclosure cover was found separated from the aircraft about 10 feet to the left side of the empennage. The activation cable was examined and the CAPS safety pin was found stowed in the handle and handle holder assembly. The CAPS system was rendered safe on site by cutting the activation cable at the fuselage station (FS) 222 bulkhead. The components that could pose a danger to personnel were removed and detonated or burned.

A fuel sample was taken from the left wing as the airplane was recovered. The fuel sample was light blue in color with no apparent contamination.

The compact flash card was removed from the multi-function display (MFD) and sent to Cirrus Design for downloading of the engine monitoring data by Avidyne Corporation technicians.

The engine inspection revealed that the crankcase was intact and undamaged. The crankshaft rotated freely and engine drive and valve train continuity was established. "Thumb" compression was obtained on all cylinders. The magnetos remained attached to the engine and were undamaged. The left and right magneto mounting flanges exhibited mechanical/rotational signatures (approx. 3 mm) on both sides of the mounting plates (paint scraped away). The left and right magnetos impulse couplings engaged when the crankshaft was rotated. The ignition harness was intact and a spark was emitted in conjunction with the impulse coupling actuation from all the upper spark plug leads. The spark plug electrodes exhibited normal operational signatures. The cylinders were examined with a borescope. No anomalies were observed to the cylinder walls, pistons, or valves. The left and right magneto-to-engine timing was checked using the timing markings on the crankshaft and found to be 22 degrees. The fuel pump drive coupling was intact and the pump rotated. The fuel pump, fuel manifold valve, and the throttle valve were sent to engine manufacturer for testing.

The propeller remained attached to the crankshaft propeller-mounting flange. The flange appeared undamaged. The propeller spinner exhibited aft crushing. All three-propeller blades remained attached to the propeller hub. The propeller and propeller governor were shipped to the propeller manufacturer for inspection.

TESTS AND RESEARCH

The MFD compact flash card was sent to Cirrus Design for downloading by Avidyne Corporation technicians with a Federal Aviation Administration inspector providing oversight. The download of the compact flash card indicated that the last flight recorded by the MFD was conducted on October 29, 2005. The data concerning the accident flight was not recorded due to memory size, or was deleted during the "power-up" of the MFD when the download was conducted.

The MFD compact flash card was sent to the Vehicle Recorders Division of the National Transportation Safety Board for inspection. The inspection confirmed that no information concerning the accident flight was found on the compact flash card.

The fuel system components were bench tested at Teledyne Continental Motors (TCM) on August 29, 2006, with National Transportation Safety Board (NTSB) providing oversight. The bench test of the fuel pump and fuel manifold valve indicated that they functioned through their full range of operation. The throttle and metering assembly, part number 653353-8A1, serial number A03JA091, was intact and undamaged. The TCM report stated that the first flow test cycle yielded values outside the TCM specifications. A second test cycle was accomplished where the assembly was adjusted to verify its ability to flow within TCM calibration specifications. Adjustments to the idle speed and mixture adjustments produced fuel flows within TCM calibration specifications. The TCM report stated, "During all test phases, the assembly functioned properly through its full range of operation."

The TCM report stated the following:

"The 'Observed' fuel flows and/or pressures are recorded without adjustment (unless noted) of the fuel system component. ... These tests and adjustments are carried out in an environment of controlled fuel supply pressures and calibrated test equipment.

When engines are installed in aircraft, they are subjected to a different induction system, fuel supply system and operating environment and may require further adjustments to compensate for these differences. It is these differences that may be present in the following test bench recorded values and TCM flow/pressure specifications. These tests are conducted to confirm that the fuel system components function adequately within its' design limitations."

A propeller teardown inspection of the McCauley propeller, model D3A34C443-A, serial number 030617, was conducted at the McCauley Propeller facility at Wichita, Kansas, on

September 21, 2006. The NTSB investigator-in-charge (IIC) provided oversight of the inspection. The inspection of the propeller revealed that all three blades were still installed in the hub. The retaining ring attachment and shim packs were all dislodged and the blades were loose. All three blades exhibited normal leading edge burnishing and paint erosion, but there were no significant leading edge gouges. The number 1 blade (marked blade C on-site) was straight and undamaged out to the tip. The tip had a rearward bend. The chamber side of the blade had chordwise scoring in the white paint. The actuating pin was broken by impact damage. The number 2 blade (marked blade A on-site) had a forward bend at approximately the 12 to 14-inch station. The blade was then straight outboard with decreased pitch twist, and the last ten inches had tip damage. The actuating pin was intact. The number 3 blade (marked blade B on-site) had an aft bend at approximately 16 to 18-inch station. The rest of the blade was straight. The actuating pin was intact. The blade angle at impact was not determined due to impact damage.

The McCauley propeller governor model, number C290D3-R/T23, serial number 030929, was inspected. The governor top cover was broken and the control shaft and control lever had received impact damage. The teardown of the governor indicated that the internal parts were intact and exhibited no damage.

ADDITIONAL INFORMATION

The Cirrus Design SR-22 Pilot Operating Handbook (POH), Section 4, Normal Procedures provides procedural information for "Balked Landings/Go-Around." The POH stated the following:

In a balked landing (go round) climb, disengage autopilot, apply full power, then reduce the flap setting to 50 percent. If obstacles must be cleared during the go around, climb at 75-80 KIAS with 50 percent flaps. After clearing any obstacles, retract the flaps and accelerate to the normal flaps up climb speed.

1. Autopilot DISENGAGE
2. Power Lever FULL FORWARD
3. Flaps 50 Percent
4. Airspeed 75-80 KIAS

After clear of obstacles:

5. Flaps UP

The Federal Aviation Administration, Cirrus Design, and Teledyne Continental Motors were parties to the investigation.

The aircraft wreckage was released to Phoenix Aviation.

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HISTORY OF FLIGHT

On February 4, 2006, at 1600 eastern standard time, a Cirrus SR-22, N667WP, registered to Aircraft Guaranty Management & Trust, LLC, was destroyed when it impacted the Atlantic Ocean shortly after taking off from Witham Field (SUA), Stuart, Florida. Instrument meteorological conditions prevailed at the time of the accident. The personal flight was being conducted under the provisions of Title 14 CFR Part 91, and an instrument flight rules (IFR) flight plan had been filed. The two instrument-rated private pilots and a passenger on board the airplane were fatally injured. The flight originated at 1556, and was en route to St. Augustine (SGJ), Florida.

N667WP took off from runway 12 at 1556. Palm Beach Approach Control tried to contact the airplane, but received no response. At that time, the airplane appeared on radar to be in a turn. At 1559, radio contact with the airplane was established and a female voice advised that they were having trouble with their instruments. At that time, its encoded altitude was 2,400 feet msl (above mean sea level). At 1600, the female voice requested, and the controller cleared the flight, to return to the airport. There was no acknowledgement. The last radar contact was at 1600:23 when the airplane was 3 miles north of the airport at a location of 027degrees, 12'16.15" north latitude, and 080 degrees, 08'00.32" west longitude, and at an altitude of 1,900 feet msl.

At 1603, American Airlines flight 2437 advised approach control that they were receiving ELT (emergency locator transmitter) signals. At 1630, airplane debris was located 5 miles east of the airport. The wreckage was found in water 60 feet deep and on a magnetic heading of 031 degrees.

PERSONNEL (CREW) INFORMATION

There were two pilots and a pilot-rated passenger aboard the airplane. The filed flight plan indicated the first pilot was the pilot-in-command.

The first pilot, age 67, held a private pilot certificate, dated May 19, 1996, with airplane single engine land and instrument ratings. He also held a third class airman medical certificate, dated July 29, 2005, with the restriction, "Holder shall possess corrective lenses for near vision while exercising the privileges of this airman certificate." When he made application for this medical certificate, he estimated his total flight time to be 648.2 hours, 32.2 hours within the last 6 months, and no less than 293.4 hours in the Cirrus SR-22. The pilot had participated in FAA's Wings Program and has been issued Phase 6 on January 25, 2005.

The second pilot, the pilot's wife, age 52, held a private pilot certificate, dated May 19, 1996, with airplane single engine land and instrument ratings. She also held a third class airman medical certificate, dated July 29, 2005, with the restriction, "Holder shall possess corrective lenses for near vision while exercising the privileges of this airman certificate. When she made application for this medical certificate, she estimated his total flight time to be 640.7 hours, 22.2 hours within the last 6 months, and no less than 63 hours in the Cirrus SR-22. According to FAA records, the pilot failed her instrument rating practical test on January 9, 2001. Two days later, she successfully passed the flight test. She also had participated in FAA's Wings Program, and has been issued Phase 6 on January 25, 2004.

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AIRCRAFT INFORMATION

N667WP, a model SR-022 (s.n. 0341), was manufactured by the Cirrus Design Corporation in October 2002. It was powered by a Teledyne Continental IO-550-N7 engine (s.n. 686391), rated at 300 horsepower, driving a Hartzell PHC-J3YF-1RF propeller (s.n. FP1925B).

According to the airplane's maintenance records, the last recorded annual inspection was accomplished on November 5, 2005. A pre-purchase annual inspection was completed on November 29, 2005, at which time the cylinders were borescoped and a compression check was performed. At that time, the airframe and engine had accrued 486.9 hours. The last bench check of the pitot-static system, including the altimeter, transponder, and encoder, was on November 4, 2004. The emergency locator transmitter (ELT) was installed in the airplane on September 2002. The ELT battery was due to expire in March 2008.

METEOROLOGICAL INFORMATION

The following special weather observation was recorded at 1547 at Witham Field (SUA), Stuart, Florida: Wind, 220 degrees true at 11 knots, gusting to 14 knots; surface visibility, 4 statute miles, rain; sky condition, 900 feet overcast; temperature 18 degrees Celsius (C.); dew point, 17 degrees C.; altimeter setting, 29.80 inches of Mercury.

AIDS TO NAVIGATION

There were no reported difficulties with aids to navigation.

COMMUNICATIONS

There were no reported communications difficulties.

FLIGHT RECORDERS

The airplane was not equipped with a cockpit voice recorder or flight data recorder, nor were they required. However, the airplane was equipped with an avionics package that included an Avidyne EX-5000 Multi-Function Display (MFD) with memory card.

WRECKAGE AND IMPACT INFORMATION

The last recorded radar contact with the airplane was at 1600:28 at a location of 27 degrees, 20.92' north latitude and 080 degrees, 13.55' west longitude. Side scanning sonar located the wreckage 3,750 feet north-northeast of the last radar contact. Water depth was 60 feet. The fuselage, engine, and propeller were in close proximity to each other. The wreckage was aligned on a magnetic heading of 031 degrees.

MEDICAL AND PATHOLOGICAL INFORMATION

The second pilot was recovered on February 14, and the first pilot and passenger were recovered on February 17, 2006. Autopsies of the three occupants were performed by the Medical Examiner-Department 19, representing St. Lucie, Martin, Indian River, and Okeechobee Counties. According to their reports, death in all three cases was attributed extensive blunt trauma. Toxicological screenings were negative for drugs and alcohol.

TESTS AND RESEARCH

The wreckage was recovered from the ocean and examined on March 3, 2006, at St. Lucie County International Airport.

The Avidyne EX-5000 MFD was recovered and sent to the manufacturer for data retrieval. According to Avidyne's report, the unit "had been exposed to a violent shock. Damage to the memory device was beyond Avidyne's capabilities to extract data."

The engine was disassembled and examined on March 3, 2006, at Opa-Locka Airport, Opa-Locka, Florida. No anomalies that would have precluded rated power production were found.

According to the BRS summary report, the CAPS system fired "sometime during initial break up of the airframe when it impacted the water. The rocket motor likely fired when the activation cable broke which put the needed pressure on the igniter spring. The resistance of the water kept the parachute and rocket close to and suspended to the airframe."

ADDITIONAL INFORMATION

In addition to the Federal Aviation Administration, parties to the investigation included Cirrus Design Corporation, Teledyne Continental Motors, and BRS.

The aircraft wreckage was released to Aircraft Guaranty Management & Trust, Houston, Texas, and the Avidyne instrumentation was released to CTC Services LAD Aviation, Inc., Orlando, Florida, on March 29, 2006.

Critical Decision Making Seminars

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1.1 HISTORY OF FLIGHT

On January 9, 2006, at 1332 Pacific standard time, a Cirrus SR20, N526CD, impacted terrain while maneuvering to return to the runway following a simulated engine failure at General William J. Fox Airfield (WJF), Lancaster, California. Gene Hudson Flight Training was operating the airplane under the provisions of 14 CFR Part 91. The certified flight instructor (CFI) pilot and the private pilot undergoing instruction (PUI) sustained fatal injuries; the airplane was destroyed. The local instructional flight departed Van Nuys, California, about 1250. Visual meteorological conditions prevailed, and no flight plan had been filed. The approximate global positioning system (GPS) coordinates of the primary wreckage were 34 degrees 45.048 minutes north latitude and 118 degrees 11.738 minutes west longitude.

The National Transportation Safety Board investigator-in-charge (IIC) interviewed the WJF air traffic controllers who were on duty at the time of the accident. The controllers reported that the Cirrus reported inbound to WJF from the south and requested to do multiple touch-and-go takeoffs and landings. The Cirrus was cleared into the pattern and advised to use runway 6. After the Cirrus had completed multiple touch-and-go takeoffs and landings, the pilot requested to make a low approach to runway 6 and on climb out, simulate an engine failure, execute a teardrop maneuver, and land using runway 24. The controller advised that the winds were 060 degrees and 10 knots, gusting to 17, and approved the pilot's requested maneuver.

The controllers observed the Cirrus make the low approach to runway 6. At the departure end of the runway, the Cirrus made a slight right turn, followed by a sweeping left turn. The controllers said the Cirrus lost a significant amount of altitude before aborting the landing. The pilot then executed a go-around, and the airplane flew north of the runway and parallel. The pilot requested to "try that again," and the tower controller advised the Cirrus that the winds were 060 degrees and 15 knots.

The controllers observed the Cirrus make another low approach to runway 6; on the upwind leg, the airplane made a slight right turn followed by a sweeping left turn. The controller did not see the airplane impact the ground as a pillar in the control tower momentarily blocked the controller's view.

Ground witnesses, just south of the accident site, observed the airplane make a left turn and then "spin into the ground."

The Safety Board IIC reviewed transcripts and recordings from communications between WJF control tower personnel and the accident airplane pilots. The first radio contact with the Cirrus occurred at 1303:04 (all times related herein have been converted from universal coordinated time to Pacific standard time). At that time, the pilot stated that the airplane was 8.8 miles to the southwest and would be doing "touch-and-goes." The Cirrus made a straight in approach to runway 06, and completed several touch-and-go landings. At 1324:59, the CFI contacted the tower with the following request, "We want to do a turn back to the runway if there's nobody around. Wanna do an engine out at the top of the climb here and then just do a turn back to land the other way. Is this a good time?" The controller responded that the Cirrus was the only one in the pattern at the time. The controller also advised, "However, wind 060 at 10 gusting 17." The CFI responded that they would "like to do that." The controller cleared the Cirrus to land on runway 24.

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As indicated above in the controller's statement, at approximately 1326, the Cirrus executed the first of two engine-out maneuvers to runway 06. At 1326:57, the Cirrus advised the tower "we are just to go back in the pattern and do normal stuff." The controller acknowledged the transmission and indicated that "you're the only one I have right now in the class delta, so advise whenever you want that approach." The pilot acknowledged the tower, continuing "we, we… if that stays that way we'll do it right now, thanks." The controller then confirmed, "Understand that you're going to be doing that this pass." The pilot responded "yes." The controller then cleared the Cirrus for a touch-and-go.

At 1331:36, the pilot advised that, "We're going to do the tear drop turning back again." The controller confirmed and reported, "wind 060 at 15, clear to land runway 24." As indicated above in the controller's statement, the Cirrus executed a low pass over runway 06, and, during the climb out, the Cirrus began a second "tear-drop" turn towards the left. The controller momentarily lost site of the Cirrus. At approximately 1332, the Cirrus impacted the terrain.

1.5 PERSONNEL INFORMATION

1.5.1 CERTIFIED FLIGHT INSTRUCTOR (CFI)

A review of Federal Aviation Administration (FAA) airman records revealed that the pilot held a commercial pilot certificate with ratings for airplane single engine land, and instrument airplane. The pilot also held a certified flight instructor (CFI) certificate with ratings for airplane single engine land.

The CFI held a second-class medical certificate issued in April 2005. It had the limitations that the pilot must wear corrective lenses and possess glasses for near and intermediate vision.

An examination of the pilot's logbook indicated an estimated total flight time of 1,052 hours. He logged 92 hours in the last 90 days, and 31 hours in the last 30 days. He had an estimated 34 hours in this make and model. He obtained his CFI rating on September 14, 2005.

1.5.2 PILOT UNDER INSTRUCTION (PUI)

A review of FAA airman records revealed that the pilot held a private pilot certificate with a rating for rotorcraft-helicopter. The pilot obtained this rating in October 1998.

The pilot held a third-class medical certificate issued March 2004. It had the limitation that the pilot must have available glasses for near vision.

An examination of the pilot's logbook indicated an estimated total flight time of 429.9 hours. He had an estimated 57.9 hours in this make and model.

1.6 AIRCRAFT INFORMATION

The airplane was a Cirrus SR20, serial number 1545, which received its airworthiness certificate on August 8, 2006, with a total flight time of 5.3 hours. A review of the airplane's logbooks revealed that the airplane had a total airframe time of 300.4 hours at the last 100-hour inspection that was completed on December 10, 2005. The Hobbs hour meter read 342.8 hours at the accident site.

The engine was a Teledyne Continental Motors (TCM) IO-360-ES6, serial number 360052, which was manufactured on July 8, 2005. Total time recorded on the engine at the last 100-hour inspection was 300.4 hours.

The propeller was a Hartzell PHC-J3YF-1RF, serial number FP3880B. Total time recorded on the propeller at the last 100-hour inspection was 300.4 hours.

Examination of the maintenance and flight department records revealed no unresolved maintenance discrepancies against the airplane prior to departure.

1.7 METEOROLOGICAL CONDITIONS

The closest official weather observation station was at General William J. Fox Airfield (WJF), Lancaster, which was located 1.5 nautical miles (nm) southwest of the accident site. The elevation of the weather observation station was 2,348 feet mean sea level (msl). An aviation routine weather report (METAR) for WJF was issued at 1256. It stated: winds from 070 degrees at 10 knots; visibility 10 statute miles; skies clear; temperature 14 degrees Celsius; dew point -04 degrees Celsius; altimeter 30.31 inHg.

According to the tower transcript, when the CFI requested the touch-and-go with the simulated engine failure, the tower controller reported that the wind was 060 degrees at 10 knots, gusting to 17 knots. About 6 minutes later when the CFI requested the second attempt, the tower controller reported that the wind was 060 degrees at 15 knots.

At 1356, the METAR for WJF reported winds from 070 degrees at 12 knots; visibility 10 statute miles; skies clear; temperature 15 degrees Celsius; dew point -04 degrees Celsius; altimeter 30.29 inHg.

1.10 AIRPORT INFORMATION

The Airport/Facility Directory, Southwest U. S., indicated that WJF runway 06/24 was 7,201 feet long and 150 feet wide. The runway surface was asphalt.

1.12 WRECKAGE AND IMPACT INFORMATION

Investigators from the Safety Board, the FAA, Cirrus Design, Teledyne Continental Motors (TCM), and BRS Parachutes examined the wreckage at the accident scene.

The first identified point of contact (FIPC) was a 35-foot-long ground scar along a magnetic heading of 110 degrees in an open field approximately 1 nautical mile northeast of the departure end of runway 06. The debris path was along a magnetic heading of 100 degrees.

The main impact point was centered 34 degrees 45.048 minutes north latitude and 118 degrees 11.738 minutes west longitude. The orientation of the wreckage was as follows: engine/fuselage, 020 heading; the fractured and separated empennage, 090-degree heading; wing spar (tip to tip), 110 degrees. There were no ground scars leading up to the main impact point.

The debris field extended out from the main impact point between 010 degrees to 150 degrees. The main debris field was between 060 degrees and 120 degrees, with a section of fuselage skin, the furthestmost component, coming to rest approximately 65 feet at 070 degrees from the main impact point. Both cabin doors and the upper engine cowling were located within the main debris field and in close proximity to the main impact point. The right aileron was located approximately 60 feet at 150 degrees from the main impact point.

The engine and propeller were located in the center of the main impact point. Both were embedded in the ground approximately 2 feet at a 70-degree angle. All flight control surfaces and components of the airplane were located at the main impact site. The 35-foot ground scar was observed on the ground adjacent to the leading edge of the wing assembly. The Cirrus' red navigation lens was intact and located on the western most end of the ground scar.

1.12.1 FUSELAGE

Impact forces destroyed the fuselage. The engine and engine mounts, which remained attached to the firewall, exhibited aft crushing. The separated upper engine cowling exhibited

leading edge crushing. The instrument panel exhibited aft crushing. The upper portion of the fuselage was separated and fractured in several locations. The cabin floor remained attached to the lower fuselage. The cabin floor and baggage compartment floor exhibited aft crushing. The front seats were separated from the fuselage. The rear seats remained attached to the aft floor. The fuselage was fractured at the fuselage station 222 bulkhead. The empennage was separated from the fuselage at the 222 bulkhead.

1.12.2 WINGS

Impact forces destroyed the wing assembly. The wing assembly exhibited leading edge crushing. The wing spar remained intact; however, the upper and lower wing skins were fractured and had separated at various locations along with wing spar. The upper and lower wing skins exhibited aft crushing and compression buckling. The left and right flaps remained attached to the wing assembly. The left aileron remained attached to its respective wing. The right aileron was located approximately 60 feet at 150 degrees from the main impact point.

Investigators confirmed flight control continuity from the left-hand aileron actuator pulley through the cockpit controls to the right hand aileron actuator pulley. The roll trim motor was in the neutral position. The flap actuator shaft was extended approximately 4 inches, which, according to the manufacturer's representative, indicated zero percent of flap extension.

1.12.3 STABILIZERS

The rudder and vertical stabilizers remained attached to the empennage but exhibited impact damage. The rudder attachment hardware and safeties were present at all three attachment points. Investigators confirmed control continuity from the rudder pedal torque tube to the rudder bellcrank at the fuselage station 306 bulkhead. The elevator and horizontal stabilizer remained attached to the empennage but exhibited impact damage. The elevator attachment hardware and safeties were present. Investigators confirmed control continuity from the elevator control torque tube to the elevator bellcrank at the fuselage station 306 bulkhead. The pitch trim motor was in the neutral position.

1.12.4 LANDING GEAR

The nose landing gear assembly was folded back under the firewall and remained attached to the engine mount. The left and right main landing gear assemblies remained attached to the wing.

1.12.5 SEATS AND RESTRAINTS

The left and right front seats separated from the fuselage. The outboard left and right front seat tracks remained attached to the fuselage. The buckled left and right front airbag seat belts remained attached to the seat frames, and had deployed. The left and right front energy absorption modules were separated from the respective front seat frames and exhibited impact damage. When measured, approximately 50 percent of the left front seat's energy absorption module was less than 0.5 inches in thickness. When measured, approximately 75 percent of the right front seat's energy absorption module was less than 0.5 inches in thickness.

The left and right rear seats remained attached to the floor.

1.12.6 COCKPIT DOCUMENTATION

The ignition switch was located in the "Both" position. The BAT1, BAT2, and ALT1 switches were in the "ON" position. The ALT2 and Avionics switches were in the "OFF" position. The fuel selector lever was in the "Right" position. The flap selector valve was in the "Up" position. The power lever was in the full aft position.

The Primary Flight Display (PFD) and the Multi-Function Display (PFD) exhibited impact

damage and had separated from their respective places in the instrument panel. The airspeed indicator exhibited impact damage. The attitude indicator was indicating a 150-degree left roll with a 25- to 30-degree nose down attitude. The altimeter exhibited impact damage, and the indication scale had separated from its housing. The altimeter's 100-foot pointer was missing. The altimeter's 1,000-foot pointer was indicating approximately 2,400 feet. The altimeter's 10,000-foot pointer was indicating approximately 98,000 feet. The Kohlsman window was set to approximately 30.14 inHg. The Hobbs meter reading was 342.8 hours.

The emergency locator transmitter (ELT) had activated, but emergency responders switched it to the "off" position by emergency personnel. All remaining instruments and gauges exhibited impact damage.

1.12.7 CIRRUS AIRFRAME PARACHUTE SYSTEM (CAPS)

The CAPS was found deployed. The CAPS safety pin with the "remove before flight" tag was located approximately 10 feet from the main impact point at 303 degrees. The CAPS activation handle was stowed in the activation handle holder. The CAPS activation cable separated from the fuselage attachment points in several locations. The CAPS activation cable housing was severed at a point approximately 3 feet forward of the igniter. The parachute enclosure cover was located on the ground near the right side of the empennage. The CAPS rocket motor, incremental bridle, and deployment bag were located approximately 90 feet at 180 degrees from the main impact point. All remaining parachute components were still attached and intact.

1.12.8 PROPELLER

The three-bladed propeller separated from the engine at the crankshaft, aft of the propeller flange. The propeller spinner exhibited impact damage. Blade 1 separated from the propeller hub and exhibited S-bending and chordwise scratching on the cambered surface. Blade 2 exhibited chordwise scratching on the cambered surface. Blade 3 exhibited heavy chordwise scratching on the chambered surface.

1.13 MEDICAL AND PATHOLOGICAL INFORMATION

The Los Angeles County Coroner completed an autopsy of both the CFI and the PUI. The cause of death for both pilots was listed as multiple traumatic injuries sustained in an airplane crash.

1.13.1 CERTIFIED FLIGHT INSTRUCTOR

Both the Los Angeles County Coroner and the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing of specimens of the CFI.

Analysis of the specimens contained no findings for volatiles. The coroner's report identified an inconclusive amount of carbon monoxide in the liver. The coroner's report contained the following positive findings for tested drugs: 98 ng/gm Tetrahydrocannabinol in the liver.

The FAA report contained the following positive findings for tested drugs: Tetrahydrocannabinol (marihuana) detected in the lung; 0.085 (ug/ml, ug/g) Tetrahydrocannabinol carboxylic acid (marihuana) detected in the urine; and 0.0484 (ug/ml, ug/g) Tetrahydrocannabinol carboxylic acid (marihuana) detected in the liver.

1.13.2 PILOT UNDER INSTRUCTION

Both the Los Angeles County Coroner and the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, performed toxicological testing of specimens of the PUI.

Analysis of the specimens contained no findings for volatiles. The coroner's report identified

less than 10 percent saturation for carbon monoxide in the blood. The coroner's report contained the following findings for tested drugs: 0.14 ug/ml Paroxetine in the blood.

The FAA report contained the following positive findings for tested drugs: 2.586 (ug/ml, ug/g) paroxetine detected in the liver; and 0.507 (ug/ml, ug/g) paroxetine detected in the kidney.

1.16 TESTS AND RESEARCH

1.16.1 ENGINE

The Safety Board, the FAA, Cirrus Design, Teledyne Continental Motors, and BRS Parachutes were parties to the investigation. Investigators examined the wreckage at Aircraft Recovery Service, Littlerock, California, on January 11, 2006.

The engine exhibited impact damage. The engine remained intact; however, the alternator and both magnetos separated from their respective mounting pads. The oil cooler was pushed forward. There was a hole in the bottom aft portion of the oil sump. The oil filler neck was separated and crushed. The ignition leads were separated from all of the top spark plugs. The number 2 intake valve cover was cracked. The number 6 cylinder exhaust valve cover was dented, and the number 6 cylinder exhaust push rod tube was dented. The number 1 push cylinder push rod was bent. The intake pipes were cracked and pushed down. The exhaust pipes were pushed up and to the rear.

Investigators removed the top spark plugs. All of the spark plugs displayed light gray deposits in the electrode area. The electrode areas of the bottom spark plugs one, three, and five were oil coated. The spark plug electrodes were gray in color, which corresponded to normal operation according to the Champion Aviation Check-A-Plug AV-27 Chart.

The propeller governor was not damaged; however, the drive shaft would not rotate. The unit was disassembled, and the oil pump gears were not damaged and were coated with oil. The fly-weights were not damaged. The oil screen was clean and clear of foreign debris.

Both magnetos separated from the engine. The right magneto had light impact damage, while the left magneto was broken in half. Investigators manually rotated the right magneto, which produced spark at all posts. The left magneto was disassembled with no abnormalities noted with the internal components.

All six cylinders were removed and examined. They all contained light scoring in the barrels and light deposits on the domes. All of the valves were in place, and the rocker arms were coated with oil. All of the valve springs were in place. The pistons were intact with light deposits on the heads. All of the piston rings were in place and were coated with oil, but were free to move. The connecting rods were coated in oil; however, they remained in place and undamaged. The camshaft was not damaged and was coated with oil. The accessory case was removed. The aft crankshaft and camshaft gears were not damaged and were coated with oil. The oil pump was free to rotate. It was disassembled. The rotor gears were intact and coated with oil.

The fuel pump was in place and broken in half. The drive coupling was not damaged. The pump was disassembled, and the rotor vanes were not damaged. No fuel was discovered in the fuel pump. The safety wire was in place on the fuel manifold. The fuel manifold was opened; the diaphragm and spring were not damaged. The fuel screen was clean and clear of debris. No fuel was observed in the manifold.

The oil filter was separated and had impact damage. The filter was opened; no metal particles were observed in the element.

1.16.2 PRIMARY FLIGHT DISPLAY (PFD) Multi-Function Display (MFD) DATA LOG RETRIEVAL

The PFD and flash memory card from the Avidyne MFD were provided to Avidyne for extraction of flight data. The PFD showed signs of significant physical damage and exposure to a blue liquid.

The MFD flash memory card was installed into an Avidyne MFD, and power was applied to the unit. The unit showed that on January 9, 2006, both navigation and obstacle databases in use were up-to-date and current, and aircraft checklist version 1.04 was installed in the unit. A Zip drive was attached to the MFD to download logged data files. The data log retrieved for the accident flight included data from a time stamp of 12:17:36, to 13:32.

The last flight entry was made at 13:32:00 on January 9, 2006. The next scheduled data-logging event would have been at 13:33:00. The unit operation ceased prior to reaching the next recording point.

At the last data sampling point, the engine rpm (revolutions per minute) was reported at 2,680 rpm, the engine manifold pressure was 27.5 inches, and the airplane electrical bus voltage was 27.5 volts.

The information from the download of the MFD was consistent with the visual information provided by witnesses. A full diagram of the flight tracks is in the public docket for this report.

The PFD was disassembled to gain access to the memory chips. The PFD's Boot ROM (read only memory) was placed on an evaluation Avionics Computing Resource (ACR) test bench at the Avidyne service center. The device was operational but showed a visible crack. Avidyne personnel soldered the device, but they were unable to make it function.

1.16.3 CIRRUS INFORMATION

A review of the Cirrus Pilot's Operating Handbook (POH) revealed no guidance for a Return to Airport maneuver following an engine failure.

During a February 16, 2004, presentation, a Cirrus Owner's and Pilot's Association (COPA) member provided information on a Return to Airport maneuver following an engine failure. The presenter indicated that a successful Return to Airport maneuver requires the following: A steep climb close to the airport; a steep turn into the crosswind (approximately 45 degrees) immediately after the engine failure (no flaps, 80 to 90 knots); and establish the best glide once the turn is complete (if less than 500 feet agl and the runway is not assured, employ CAPS). The COPA presentation indicated that a downwind departure is a better option for most pilots. It provides more flexibility in dealing with engine failures or other emergencies.

1.18 ADDITIONAL INFORMATION

The IIC released the wreckage to the owner's representative on May 1, 2006.

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N799TM 20051229

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N254SR 20071230

N414CD 20071128

N482SR 20071125

N108GD 20071121

N901SR 20070202

N457S 20061218

N665CD 20061130

N969ES 20061027

N121LD 20061025

N929CD 20061011

N787SL 20060915

N91MB 20060828

N8163Q 20060711

N667WP 20060204

N526CD 20060109

N799TM 20051229

N621PH 20051211

N286CD 20050206

N6057M 20050120

N889JB 20050115

N1159C 20041204

N1223S 20040910

N8157J 20040419

N100BR 20031012

N9523P 20030118

N566T 20021103

ATL06FA029

HISTORY OF FLIGHT

On December 29, 2005, approximately 1300 eastern standard time, a Cirrus SR22, N799TM, registered to Energy Systems Cirrus LLC, and operated by a private individual, as a 14 CFR Part 91 personal flight, collided with the Savannah Ridge Mountain near Sylva, North Carolina. Instrument meteorological conditions prevailed at the time of the accident, and the IFR flight plan filed by the pilot for the flight from Sylva, North Carolina to Pesacola, Florida, was not activated. A post crash fire ensued, and the airplane was destroyed. The private-rated pilot and passenger were fatally injured. The flight departed Jackson County Airport, Sylva, North Carolina, on December 29, 2005, at an undetermined time. The airplane was reported missing on December 29, 2005.

On December 29, 2005, about 1227, a person identifying himself as the pilot N799TM contacted the FAA Gainesville, Georgia; Flight Service Station (FSS) requesting to file an instrument flight plan and received a weather briefing for a flight from Sylva, North Carolina, to Pensacola, Florida. The Gainesville FSS briefer informed the pilot of the current weather conditions, and referenced the flight precaution for mountain obscuration through out the day. The pilot stated to the briefer "that he was looking through a "hole" right now, and was pretty sure he could stay VFR. The pilot also informed the briefer "he could see the top of the clouds, and see a little bit of the blue". The briefer also informed the pilot of a flight precaution for moderate turbulence below ten thousand feet. The pilot stated, "that he would be looking for it". Prior to departing Jackson County Airport, the pilot inquired as to how to activate an IFR flight plan once he departed. The briefer informed the pilot he could open the IFR flight plan once airborne. There were no further communications or records of radar data for the airplane once airborne.

Witnesses in the area of the accident site reported hearing an airplane flying low in a southerly direction. The airplane changed course several times, and it seemed as though the pilot was lost. Witnesses heard the sound of the engine fade away, and then "rev-up" followed by the sound of trees breaking along with a loud "thump". Witnesses recalled that the weather at the time of the accident was foggy, and stated "that you could not see more that 50-feet in front of you". The witnesses called the 911 operators at 1302, and reported the accident.

Search and rescue operations were initiated by the Jackson County Emergency Communication Center. The wreckage of N799TM was located on the Savannah Ridge Mountain on December 30, 2005, at 0932 at an elevation of 4,400 feet.

PILOT 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 on June 2, 1997, with ratings for airplane single-engine land. The pilot was issued an instrument rating on June 30, 2001. Review of the pilot's logbook revealed he had a total flight time of 782.7 hours of which 227.2 flight hours were in the Cirrus SR-22. The pilot logged 60.3 flight hours of actual instrument time, and 86.3 flight hours of simulated instrument time. The pilot completed his last flight review on March 6, 2005. The private pilot held a third class medical certificate dated December 17, 2004, with restrictions for corrective lenses.

N901CD 20020528

N837CD 20020424

N893MK 20020123

N116CD 20010410

AIRCRAFT INFORMATION

Review of aircraft logbooks indicated that the last recorded altimeter, static system, transponder, and altitude system checks were completed on January 18, 2004. The last annual inspection was conducted on February 10, 2005. The Hobbs time and total aircraft time at the annual inspection was 144.8 hours. Review of the airplane's flight log revealed on December 29, 2005 prior to the flight the Hobbs time indicated 263.1 hours. The Hobbs meter and engine tachometer were fire damaged.

METEOROLOGICAL INFORMATION

The surface observations from the nearest weather observatory are as follows:

Macon County Airport (K1A5), Franklin, North Carolina: Field elevation 2,020 feet msl, located approximately 256 degrees at 9 nautical from the accident location, Aviation Weather Observation Station-3 (AWOS-3) forecasted: Time-1240; winds 350 degrees at 10 knots; visibility 10 miles; sky condition scattered 2,300 feet, and ceiling overcast 4,100 feet; temperature 43 degrees Fahrenheit; dew point 34 degrees Fahrenheit, and an altimeter setting of 29.68.

Andrew-Murphy Airport (KRHP), Andrews, North Carolina: Field elevation 1,697 feet msl, located approximately 264 degrees at 30 nautical miles from the accident location, AWOS-3 forecasted: Time-1302; winds 210 degrees at 4 knots; visibility 1 miles; sky conditions scattered 2,200 feet, and ceiling overcast 2,900 feet; temperature 43 degrees Fahrenheit; dew point 34 degrees Fahrenheit, and an altimeter setting of 29.71.

Asheville Regional Airport (KAVL), Asheville, North Carolina: Field elevation 2,165 feet msl, located approximately 072 degrees at 37 nautical miles from the accident site, AWOS-3 forecasted: Time-1354; winds 360 degrees at 14 knots, gusting 21 knots, visibility 10 statute miles, ceiling 1,200 foot overcast, temperature 37 degrees Fahrenheit, dew point 32 degrees Fahrenheit, and an altimeter setting 29.65.

WRECKAGE EXAMINATION

The airplane collided with the Savannah Ridge Mountain at coordinates, 35:14:46N, 083:14:38W approximately 5 miles southwest of the Jackson County Airport. The top of the mountain is 4,600 feet, and the airplane collided with the mountain on a 300-degree heading at an elevation of 4,400 feet. All components of the airplane were located at the accident site. The cockpit, and cabin area was consumed by fire, including the instrument panel. The fire damage extended aft to the empennage. The throttle, propeller, and mixture controls were fire damaged. Flight control continuity was confirmed from both control wheels reward to all flight control surfaces. The nose wheel landing gear was separated from the airframe and lodged under the engine.

The aft fuselage was destroyed by fire forward of the empennage. The vertical stabilizer was attached to the empennage with the rudder attached. The right, and left horizontal stabilizers were fire damaged. The right elevator was separated at the center and outboard hinge. The left elevator was attached to the horizontal stabilizer.

The right wing assembly was attached to the fuselage and fire damaged. The right aileron was attached at the inboard hinge, and the outboard aileron hinge bolt was separated from the aileron. The right wing tip assembly was separated from the wing. The right main fuel tank was rupture and fire damaged. The flap remained attached to the right wing assembly, and was in the retracted position. The right main landing gear was separated from the fuselage, and fire damaged.

The left wing assembly remained attached to the fuselage and was fire damaged. The left aileron was separated from the wing assembly and fire damaged. The left main fuel tank was

rupture and fire damaged. The left flap was attached and fire damaged. The flap actuator was extended two inches and attached to the torque tube. The left main landing gear was separated from the fuselage, and fire damaged.

The engine assembly was attached to the mounts, separated from the firewall, displaced to the right and fire damaged. The engine crankshaft could not be rotated. Examination of the engine assembly revealed the starter and the number two alternator were separated from the engine. The intake pipes were melted on top of the engine. The exhaust pipes were crushed upwards, and all accessories on the rear of the engine were melted. The number two cylinder head was partly separated exposing the piston. The number one cylinder head had impact damage, and the number one cylinder exhaust rocker arm was separated. The through bolt nuts on the cylinders one, two, and four in the upper left hand corner were separated. All engine cylinders were bore scope in accordance with the Continental Service Bulletin SB03-3. The cylinder barrels were rusted, and corroded. The piston heads revealed combustion deposits. All of the valves were in place except the number two-intake valve, which was separated. The crankshaft, and camshaft were examined with a bore scope from the bottom of the engine. They both were intact, and lightly coated with oil. The gears on the crankshaft and camshaft were not damaged, and were lightly coated with oil.

Examination of the throttle control revealed it was connected to the throttle body, and was in the mid-range position. The mixture control was separated, and melted away from the rear of the fuel pump. The propeller governor control was connected, and in the full aft position.

The left and right magnetos were attached to the engine, and fire damaged. The magnetos were disassembled, and were internally fire damaged and melted. The ignition harnesses were fire damaged.

The upper and lower spark plugs were removed for examination and the electrodes revealed "normal wear" when compared to the Champion "Check-A-Plug" Chart.

The fuel pump was attached to the engine case, and fire damaged. The drive coupling was intact and not damaged. The fuel pump was disassembled and the rotor vanes were damaged.

The fuel manifold was fire damaged was safety wired, remained attached to the engine, attached to the engine assembly, and was fire damaged. The fuel manifold was disassembled, and the diaphragm was melted. The internal fuel screen was clean of debris and dry. All injector lines and nozzles were attached to the engine cylinders, and were fire damaged. The oil pump was melted, and fire damaged exposing the bottom rotor gear. The oil sump was removed and no metal or oil was found in the sump.

The propeller remained attached to the crankshaft, the spinner was crushed, and all three blades were loose in the hub. Blade number one was twisted toward the direction of rotation, and wrinkled at the blade tip. Blade number two was curled toward the non-cambered side, and curled at the tip. Blade number three was bent toward the non-cambered side, and curled at the tip.

The Ballistic Parachute System (BRS) rocket was located near the right side of the fuselage aft of the wing and was fire damaged. Sections of the incremental bridle were found fire damaged.

PATHOLOGICAL INFORMATION

The Office of the Chief Medical Examiner, Chapel Hill, North Carolina preformed the postmortem examination of the pilot on December 31, 2005. The cause of death was "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 carbon monoxide, cyanide, and ethanol.

The Office of the Chief Medical Examiner, Chapel Hill, North Carolina preformed the postmortem and Toxicology examination of the passenger on December 31, 2005. The cause of death was "blunt force trauma". The results of the toxicology report were negative for ethanol.

ADDITIONAL INFORMATION

The wreckage of the airplane was released to Phoenix Aviation, Atlanta, Georgia, on March 21, 2006.

[PDF File](#)



Critical Decision Making Seminars

N621PH 20051211

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CHI06FA043

N254SR 20071230

HISTORY OF FLIGHT

N414CD 20071128

On December 11, 2005, at 1716 central standard time, a Cirrus SR22, N621PH, piloted by a private pilot, was destroyed during an in-flight collision with terrain near Arco, Minnesota. The flight was being conducted under 14 CFR Part 91 without a flight plan. Instrument meteorological and marginal visual meteorological conditions prevailed in the vicinity of the accident site at the time. The pilot and 2 passengers sustained fatal injuries. The flight departed Wayne Municipal Airport, Wayne (LCG), Nebraska, at 1608, with an intended destination of Flying Cloud Airport (FCM), Minneapolis, Minnesota.

N482SR 20071125

N108GD 20071121

N901SR 20070202

N457S 20061218

Federal Aviation Administration (FAA) Air Traffic Control (ATC) radar and voice communication data were provided by Sioux Falls approach control and Minneapolis Air Route Traffic Control Center (ARTCC). Additional flight data was downloaded from the Multi Function Display (MFD) unit on-board the accident aircraft.

N665CD 20061130

N969ES 20061027

N121LD 20061025

An individual representing N621PH contacted Columbus Automated Flight Service Station (AFSS) about 1522 and requested a pre-flight briefing for the route from LCG to FCM. The proposed flight was to be conducted under visual flight rules (VFR) and was estimated to depart within 30 minutes of the call.

N929CD 20061011

N787SL 20060915

N91MB 20060828

The briefer informed the caller that VFR flight was not recommended due to an Aeronautical Meteorological Information (AIRMET) weather advisory for instrument flight rules (IFR) conditions over north central Iowa and southwestern Minnesota. The briefer noted current reports of IFR conditions at Estherville (EST), Iowa, Fairmont (FRM), Minnesota, and Windom (MVM), Minnesota. Detailed weather information is contained in the meteorological conditions section of this factual report.

N8163Q 20060711

N667WP 20060204

N526CD 20060109

Data indicated that the accident flight departed LCG at 1608 and proceeded northeast. The aircraft's course changed from northeast to northwest about 1625. At 1636, the pilot of the accident airplane contacted Sioux Falls approach control and requested VFR flight following en route to FCM via FSD and Montevideo (MVE), Minnesota. ATC issued a discrete transponder code and identified the flight on radar at 3,500 feet mean sea level (msl), about 30 nautical miles (nm) south-southeast of FSD.

N799TM 20051229

N621PH 20051211

N286CD 20050206

The flight continued on the northwesterly course until 1642, when the aircraft turned to a northerly course directly toward FSD. The flight was approximately 22 nm south of FSD at that time. When the aircraft reached a point approximately 8 nm south of FSD the pilot requested to proceed direct to MVE. The request was approved and the aircraft proceeded on a northeasterly course toward MVE.

N6057M 20050120

N889JB 20050115

N1159C 20041204

N1223S 20040910

As the flight approached the limit of FSD approach airspace to the northeast, the controller contacted Minneapolis ARTCC to inquire about a handoff. The Minneapolis ARTCC controller was unable to accept the handoff, noting that radar coverage would not be possible in that sector at the altitude the aircraft was operating. The FSD controller attempted to contact the accident flight to terminate VFR flight following five times between 1701 and 1704. There was no response from the aircraft.

N8157J 20040419

N100BR 20031012

N9523P 20030118

At 1656, the pilot contacted the flight watch position at Princeton AFSS. The pilot informed the briefer that the flight was approximately 10 miles northeast of FSD en route to MVE. He

N566T 20021103

N901CD 20020528

N837CD 20020424

N893MK 20020123

N116CD 20010410

requested weather advisories along the proposed route of flight. The briefer provided an advisory for IFR conditions for southwestern portions of Minnesota due to the possibility of light snow. The briefer noted that MVE had been reporting light snow, but that the most recent observation indicated "unrestricted visibility" and an overcast cloud ceiling at 2,000 feet above ground level (agl).

At 1707, the pilot contacted Minneapolis ARTCC. He stated that he "had switched off the radio inadvertently," and requested VFR flight following to MVE. He reported that the aircraft was 25 miles east of Brookings Very-High-Frequency Omni Range (VOR) radio navigational station at 2,500 feet msl. He noted that he was still on the discrete transponder code assigned by FSD approach.

At 1708, the Minneapolis ARTCC controller replied: "Okay at twenty five hundred . . . I see ya out there on radar but I'm going to lose ya in just a bit . . . besides I'll probably lose ya on the frequency at that altitude also ah . . . so do you want to go up for advisories or ah go back to your twelve hundred code and maintain VFR." The pilot replied: "Okay I best . . . I better go back to twelve hundred then just go VFR . . . cause I got clouds above me."

No further voice communications were received from the accident aircraft.

The radar track data indicated that the pilot switched to the 1200 transponder code about 1709. After that point, the aircraft continued on a northeast course until approximately 1710:07, when the airplane turned to an easterly course. The track data showed that the airplane returned to a northeast course about 1711:08. At that time, the transponder altitude return was 2,500 feet msl.

Between 1711:08 and 1715:09, the radar data indicated the airplane continued northeast bound, however, the altitude returns decreased from 2,500 feet msl to 2,100 feet msl. About 1714:09, the aircraft's track turned to the north until 1715:09. The altitude returns remained at 2,100 during this time period.

According to the radar track data, about 1715:09, the aircraft entered a climbing, right turn, and continued in that turn until the final radar data point at 1716:20. In addition, the turn radius decreased during the course of the turn. Altitude returns increased from 2,100 feet msl at 1715:09, to 2,800 feet msl at 1716:20.

No further radar returns attributable to the accident aircraft were recorded.

A local resident reported hearing an aircraft about 1730. She also reported that she thought she heard an "explosion" and "glass breaking."

An emergency locator transmitter signal was detected by the Air Force Rescue Coordination Center via the Search and Rescue Satellite-Aided Tracking (SARSAT) network at 1858. The local Civil Air Patrol detachment was notified and subsequently located the aircraft about 0030 on December 12th.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with a single-engine land airplane rating, issued on January 17, 2001. He held a second-class medical certificate issued on October 20, 2004, with a limitation that corrective lenses be worn. According to FAA data, he did not have an instrument rating.

The pilot purchased the accident airplane in November 2005, approximately one month prior to the accident. He completed the transition-training course for new Cirrus owners conducted by the University of North Dakota on November 30, 2005. He logged 26.8 hours in the SR22, all in the accident airplane, during the course. All of this was logged as dual flight instruction. At the completion of the course, the pilot was given a current flight review endorsement. His total flight time in SR22 aircraft at the time of the accident was 41.6 hours.

The pilot's logbook was reviewed. Flight data downloaded from the airplane's MFD unit included three flights prior to the accident flight, which were not noted in the logbook. Based on the logbook entries and MFD data, the pilot had accumulated 271.9 hours total flight time. Five hours of flight time were logged in single-engine seaplanes. All of the remaining flight time was in single-engine land airplanes.

The pilot had logged 3.4 hours and 44.2 hours of actual and simulated instrument flight time, respectively. Total logged night flight time was 19.2 hours. Flight time in high performance airplanes totaled 49.6 hours, according to logbook entries and MFD data.

AIRCRAFT INFORMATION

The accident airplane was a 2005 model year Cirrus SR22 (serial number 1481). The airplane was a single-engine, low wing airplane of predominantly composite (fiberglass) construction.

The airplane was powered by a Continental Motors IO-550-N (27) fuel-injected engine (serial number 917753). It was equipped with a 3-blade, constant speed Hartzell propeller.

The airplane was issued an airworthiness certificate on June 15, 2005, as a new aircraft. An annual inspection was completed on November 2, 2005. The aircraft had accumulated a total flight time of 265.3 hours at the time of that inspection. Total time on the aircraft at the time of the accident was 317.8 hours.

METEOROLOGICAL CONDITIONS

The Marshall Airport-Ryan Field (MML) Automated Weather Observing System (AWOS), located 15 miles east-northeast of the accident site, at 1715, recorded: Wind from 100 degrees at 7 knots; 10 statute miles (sm) visibility; few clouds at 400 feet agl; overcast clouds at 800 feet agl; temperature and dew point were -4 and -6 degrees Celsius, respectively; altimeter 29.74 inches of mercury.

The Pipestone Airport (PQN) AWOS, located about 25 miles south-southwest of the accident site, at 1657, recorded: Wind from 340 degrees at 16 knots, gusting to 23 knots; 10 sm visibility; overcast clouds at 1,400 feet agl; temperature and dew point were 3 and 2 degrees Celsius, respectively; altimeter 29.68 inches of mercury.

At 1717, the PQN AWOS recorded: Wind from 340 degrees at 15 knots, gusting to 21 knots; 10 sm visibility; overcast clouds at 1,200 feet agl; temperature and dew point were 3 and 2 degrees Celsius, respectively; altimeter 29.69 inches of mercury.

Weather conditions at the Sioux Falls - Foss Field (FSD), located 65 miles southwest of the accident site, at 1656, were recorded as: Wind from 310 degrees at 16 knots; visibility 10 sm; overcast clouds at 3,600 feet agl; temperature and dew point were 3 degrees and 0 degrees, respectively; altimeter 29.72 inches of mercury.

Conditions at the Sioux Gateway Airport (SUX), located 125 miles south of the accident site, at 1552, recorded: Wind from 310 degrees at 19 knots, gusting to 26 knots; 10 sm visibility; clear skies; temperature and dew point were 6 degrees and 1 degree Celsius, respectively; altimeter 29.76 inches of mercury. SUX was located 28 miles northeast of the departure airport, LCG.

Conditions along the originally proposed route of flight from LCG to FCM were provided by the AFSS briefer during preflight weather briefing.

The Estherville Municipal Airport (EST) Automated Surface Observing System (ASOS), at 1517, recorded: Wind from 130 degrees at 8 knots; 10 sm visibility; broken clouds at 800 feet agl; overcast clouds at 1,200 feet agl; temperature and dew point were -4 and -6 degrees Celsius, respectively; altimeter 29.70 inches of mercury.

The Fairmont Municipal Airport (FRM) AWOS, at 1515, recorded: Wind from 130 degrees at 8

knots; 7 sm visibility; broken clouds at 100 feet agl; overcast clouds at 1,400 feet agl; temperature and dew point were -6 and -7 degrees, respectively; altimeter 29.73 inches of mercury.

The Windom Municipal Airport (MWM) AWOS, at 1515, recorded: Wind from 110 degrees at 8 knots; 5 sm visibility with mist; overcast clouds at 700 feet agl; temperature and dew point were both -4 degrees Celsius; altimeter 29.66 inches of mercury.

The area forecast for western and southern Minnesota current at the time of the accident was issued at 1345, and was valid until 0200 on December 12. The forecast for southwestern Minnesota called for overcast ceilings between 1,000 and 2,000 feet agl; cloud tops between 8,000 feet and 10,000 feet msl; occasional light snow and mist, which was forecast to end between 2000 and 2300.

The area forecast for the remaining portions of western and southern Minnesota called for broken to overcast ceilings between 2,000 and 3,000 feet agl, and cloud tops at 10,000 feet msl. A chance of light snow was also forecast over that area.

A routine terminal forecast for FSD was issued at 1130, and was valid from 1200 until 1200 on January 12. The forecast noted, beginning at 1400, winds from 300 degrees at 14 knots, gusting to 20 knots, and broken clouds at 6,000 feet agl. From 1700 through 2100, the forecast called for winds from 310 degrees at 14 knots, and scattered or temporarily broken clouds at 3,000 feet agl.

An amended terminal forecast for FSD was issued at 1551 and was valid beginning at 1600. The forecast noted winds from 300 degrees at 15 knots, scattered or temporarily broken clouds at 2,500 feet agl, and overcast clouds at 4,000 feet agl until 2000. From 2000, the forecast noted winds from 300 degrees at 8 knots and overcast clouds at 2,500 feet.

AIRMET Sierra (Update 5) was issued at 1445 and was valid until 2100. The AIRMET noted the possibility of IFR conditions - ceilings below 1,000 feet agl and/or visibilities less than 3 sm in clouds, precipitation or mist - east of a line from Quincy (UIN), Illinois, to 20 miles southeast of FSD to 50 miles north of Redwood Falls (RWF), Minnesota. The conditions were expected spread east southeastward and to continue beyond 2100.

Winds aloft data for the accident site were obtained from the National Oceanic and Atmospheric Administration (NOAA). The data was based on soundings taken at 1800 (0000Z on December 12, 2005). A copy of the winds aloft data is included in the docket material associated with this report.

According to United States Naval Observatory data, sunset occurred at 1645 at the site on the day of the accident. Civil twilight ended at 1719.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted an agricultural field approximately 5 miles northeast of Arco, Minnesota. The site was located at 44 degrees 24.397 minutes north latitude, 096 degrees 04.880 minutes west longitude. Elevation at the accident site was approximately 1,581 feet. The airplane was oriented on an approximate magnetic heading of 166 degrees.

First responders to the accident site reported that the snow cover surrounding the aircraft was undisturbed at the time of their arrival on scene.

The airplane came to rest upright. The main wreckage consisted of all major aircraft components. The upper half of the engine cowling, and the cabin doors were separated from the fuselage. They came to rest approximately 18 feet south of the main fuselage - in front of the aircraft relative to its heading.

The Cirrus Airframe Parachute System (CAPS) had deployed. The fuselage cover for the

CAPS system was separated and lying approximately 10 feet west of the main wreckage. The cockpit activation handle was in the stowed position at the accident site. The position of the handle and damage to the airframe were consistent with the system being deployed as a result of the impact sequence and not as an intentional activation by the pilot.

The engine and propeller were imbedded about 4 feet into the ground. They were oriented approximately 30 degrees relative to the terrain with the rear of the engine higher than the nose. The propeller remained attached to the engine crankshaft.

The cockpit and cabin sustained extensive damage. The cabin roof was separated from the lower fuselage at the doorposts and rear fuselage. The roof section was resting upright and dislocated to the right relative to the fuselage.

The pilot control yokes exhibited damage consistent with impact forces. The elevator control cable attachment fittings remained secured to the torque tube bell cranks. The bell crank arms were bent but otherwise intact. The bell crank fitting remained secured to the elevator control torque tube. The rudder control cable attachment fittings remained secured to the rudder pedal torque tube. The rudder pedals and torque tubes sustained damage consistent with impact forces.

The fuselage was separated from the empennage across the upper half of the airframe near the baggage area. The empennage was intact aft of that point. The elevator and rudder flight control surfaces remained attached to the airframe at their respective hinge points. Control continuity was confirmed from the elevator and rudder to the aft cabin.

The wings were in position relative to the fuselage, however they were partially separated and dislocated. The wing chord line was oriented at an approximate angle of 30 degrees relative to the terrain. The leading edge was crushed aft along the entire length of both wings. The upper wing skin was buckled spanwise near the leading edge. A depression in the terrain approximately 14 inches wide by 6 inches deep was observed adjacent to the wing leading edges and spanned the entire length of both wings.

The ailerons and flaps remained attached to the wings at the hinge points. The hinge fittings were intact with the exception of the outboard right flap fitting which had separated from the flap rib. The attachment rivets common to the fitting failed in a manner consistent with an overload condition.

Aileron control continuity was confirmed from each bell crank to the wing root. The right and left aileron bell cranks were intact. The cable separation at the wing root was frayed in a manner consistent with overload. The roll trim actuator was damaged, however, the linkage from the actuator to the aileron bell crank remained intact. The upper wing skin and spar in the area of the trim actuator sustained impact damage.

The flap torque tube was bent. The linkage to the right flap was intact and remained attached to the flap. The linkage to the left flap was separated from the flap consistent with an impact failure. The flap actuator extension was consistent with a flaps-up configuration.

The propeller blades were arbitrarily numbered. Blade 1 was rotated about 180 degrees within the spinner collar, with the rear face of the blade oriented forward relative to the spinner. It exhibited S-shaped bending along its span and twisting toward low pitch. Blade 2 was bent aft about 20 degrees about at a point approximately 10 inches from the blade root. It exhibited minor S-shaped bending, twisting toward low pitch, and chordwise scratches. Blade 3 was bent aft approximately 60 degrees beginning near the blade root. It exhibited leading edge gouges and chordwise scratches.

Internal engine and accessory section continuity was confirmed by rotation of the crankshaft. Compression was obtained at all cylinders. The magnetos were dislocated from their mounts.

The units were installed on a test bench and ignition spark was observed across all leads on both magnetos. Appearance of the spark plug electrodes was consistent with normal wear.

The fuel manifold was disassembled. The diaphragm and screen were intact and free of debris and sediment. A small amount of fluid consistent in appearance and odor to aviation fuel was present in the unit. The throttle body was intact. The throttle valve freely rotated by hand.

Throttle and propeller control continuity was confirmed from the throttle body and the propeller governor to the firewall, respectively. The mixture control linkage was broken off at the cable end fitting common to the fuel pump. The fracture surface appearance was consistent with an overload failure.

Examination of the airframe and engine did not reveal any anomalies consistent with a pre-impact failure.

The recording hour meter indicated 317.8 hours when observed at the accident site.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was performed by the deputy medical examiner of Hennepin County, Minnesota, on December 14, 2005.

Toxicology testing was performed by the FAA Civil Aero Medical Institute. No reportable results were detected for any substances tested.

TESTS AND RESEARCH

Radar data provided by Minneapolis ARTCC was plotted. A plot of the data is included in the docket material associated with this report.

The accident airplane's calibrated airspeed was derived from radar and winds aloft data. A plot of calibrated airspeed and stall speed versus elapsed time is included with the docket material associated with this report.

According to the calculations, the airplane maintained a calibrated airspeed of 120 knots or greater until 1715. About that time, the plot of radar track data indicated that the airplane entered a right turn, which continued until the final radar data point at 1716:20. The airplane's calibrated airspeed decreased to approximately 41 knots during that time.

The pilot's operating handbook listed the airplane's stall speed at gross weight (3,400 lbs.) in various flight configurations. With the center-of-gravity (CG) located at the forward limit, the published stall speed was 69 knots calibrated airspeed in level flight with flaps up. The stall speed increased to 74 knots and 82 knots at a 30-degree and 45-degree bank angle, respectively. With the CG at the aft limit, the corresponding stall speeds were 2 - 3 knots lower.

The Multi-Function Display (MFD) unit recorded 27 parameters onto a compact flash data card installed in the unit. The data card was intact and the data was successfully downloaded. The recorded parameters included: the current time; present GPS location; engine exhaust gas temperatures; engine cylinder head temperatures; oil temperature and pressure; engine speed (RPM); fuel flow, cumulative fuel used during the current flight; alternator 1 and 2, and battery current readings; and, main and essential bus voltages. Altitude information was not a recorded parameter.

According to Avidyne, the manufacturer of the MFD, the unit recorded the designated parameters every 6 seconds into volatile memory on one of the circuit boards. Then every 60 seconds, the accumulated parameters held in volatile memory are written onto the compact flash non-volatile memory data card. When power is removed from the MFD unit, any of the parameters held in volatile memory are lost.

Review of the data from the accident flight revealed that all recorded engine and electrical

system parameters were within published limitations for the duration of the flight.

A plot of the MFD position data for the accident flight is included in the docket material associated with this report. The final recorded data point was taken at 1715:18.

ADDITIONAL INFORMATION

The NTSB retained the MFD data card for further analysis. The remainder of the aircraft was released at the conclusion of the on-scene investigation on December 13, 2005. A representative of the aircraft salvage company acknowledged release of the aircraft.

The MFD data card was returned on March 7, 2006. A representative of the insurance company acknowledged receipt of the data card.

Parties to the investigation were the FAA, Cirrus Design Corporation, and Teledyne Continental Motors.

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N1159C 20041204

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LAX05FA088

HISTORY OF FLIGHT

On February 6, 2005, about 1820 Pacific standard time, a Cirrus Design SR22 G2, N286CD, impacted mountainous terrain after encountering icing conditions near Norden, California. The owner/pilot was operating the airplane under the provisions of 14 CFR Part 91. The private pilot, the sole occupant, sustained fatal injuries; the airplane was destroyed. The personal cross-country flight departed Reno/Tahoe International Airport (RNO), Reno, Nevada, about 1750, en route to Oakland, California. Instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan had been filed. The primary wreckage was at 39 degrees 17 minutes north latitude and 120 degrees 20 minutes west longitude.

The National Transportation Safety Board investigator-in-charge (IIC) reviewed recorded radar data and noted a secondary 4271 discreet beacon code at a mode C reported altitude of 4,600 feet msl (mean sea level). Recorded radar data indicated that the airplane took off from RNO and executed the Mustang 6 departure (standard instrument departure procedure (SID)). The airplane climbed on a westerly course for about 18 minutes 30 seconds, and obtained a mode C reported altitude of 16,100 feet msl.

The radar data indicated the airplane leveled off and maintained 16,100 feet msl for about 3 minutes 40 seconds. Radar data showed the airplane initiated a climb and obtained a mode C reported altitude of 16,700 feet msl. The last 12 seconds of recorded radar data indicated the airplane was in a descent. Radar contact was lost at 18:17:29, at a mode C reported altitude of 15,700 feet msl.

During the flight, the pilot reported to air traffic controllers that he was in icing conditions and was not able to maintain altitude.

PERSONNEL INFORMATION

A review of Federal Aviation Administration (FAA) airman records revealed that the pilot held a private pilot certificate with ratings for airplane single engine land and instrument airplane.

The pilot held a third-class medical certificate issued on July 13, 2004, with a limitation that the pilot must possess corrective glasses for near vision.

An examination of the pilot's logbook indicated an estimated total flight time of 473.2 hours. He logged 100.4 hours in the last 90 days, and 38.9 hours in the last 30 days. He had an estimated 69 hours in the accident airplane make and model. He completed a biennial flight review on December 29, 2004.

AIRCRAFT INFORMATION

The airplane was a Cirrus Design SR22 G2, serial number 1235. A review of the airplane's logbooks revealed an entry for an annual inspection dated December 20, 2004. A total airframe time of 5.0 hours was reported at the last annual inspection. The Hobbs hour meter read 71.4 at the last maintenance, which was recorded in the logbook as January 23, 2005.

The engine was a Teledyne Continental Motors IO-550-N engine, serial number 917485. Total time on the engine at the last annual inspection was 5.0 hours.

N901CD 20020528**N837CD 20020424****N893MK 20020123****N116CD 20010410**

Fueling records at Mercury Air Center, located at RNO, established that the airplane was last fueled on February 6, 2005. The airplane was refueled to capacity with the addition of 20.6 gallons of 100LL-octane aviation fuel. Examination of the maintenance records revealed no unresolved maintenance discrepancies against the airplane prior to departure.

The accident airplane was equipped with an Ice Protection System. This system was designed and certified for the Cirrus SR22 as a "No Hazard" to normal operations, allowing a pilot who inadvertently enters icing conditions to activate the system. Once the system is activated, deicing fluid flows along the wing, horizontal stabilizer, and propeller blades.

The Ice Protection System section of the Pilot Operating Handbook (POH) Supplements (Section 9) states in the Limitations Section that flight into known icing is prohibited. The POH further states, "no determination has been made as to the capability of this system to remove or prevent ice accumulation."

Section 3, titled Emergency Procedures, under the heading of "Inadvertent Icing Encounter" states: "Flight into known icing conditions is prohibited."

The Ice Protection System section of the POH Supplements (Section 9) also states in part: "Flight into known icing is prohibited. The Ice Protection System has not been evaluated in known icing conditions. At the first indication of icing, the most expeditious and safest course of exiting the icing conditions should be taken."

METEOROLOGICAL CONDITIONS

The closest official weather observation station was Truckee-Tahoe Airport (TRK), Truckee, California, which was located 9.3 nautical miles (nm) northeast of the accident site. The elevation of the weather observation station was 5,900 feet msl. An aviation routine weather report (METAR) for TRK was issued at 1810. It read: Winds from 240 degrees at 6 knots; visibility 10 statute miles; skies 3,400 feet broken, 10,000 feet overcast; temperature 03 degrees Celsius; dew point -03 degrees Celsius; altimeter 29.87 inHg (inches of Mercury).

The Safety Board staff meteorologist prepared a factual report, which included the following weather for the departure airport (RNO) and the nearest airport to the accident site (TRK):

Reno/Tahoe International Airport (RNO), Reno, field elevation 4,415 feet msl, located approximately 067 degrees at 29 nautical miles from the accident location, augmented Automated Surface Observation System (ASOS).

Time-1656; type-METAR; wind-calm; visibility 10 statute miles; present weather - none; sky condition - broken 11,000 feet; temperature 06 degrees Celsius; dew point -01 degree Celsius; altimeter setting 29.82 inHg; remarks - none.

Time-1756; type-METAR; wind 020 degrees at 6 knots; visibility 10 statute miles; present weather - none; sky condition - overcast 5,500 feet; temperature 06 degrees Celsius; dew point -01 degree Celsius; altimeter setting 29.83 inHg; remarks - none.

Time-1856; type-METAR; wind variable at 4 knots; visibility 10 statute miles; present weather - none; sky condition - broken 6,000 feet overcast 8,000 feet; temperature 06 degrees Celsius; dew point -03 degrees Celsius; altimeter setting 29.83 inHg; remarks-none.

COMMUNICATIONS

The pilot contacted Reno Flight Service Station (FSS) at 1620 on February 6, 2005. The pilot received a standard weather brief and filed an IFR flight plan.

The Safety Board IIC reviewed the recorded conversations between the FSS briefer and the

accident pilot.

The pilot filed his IFR flight plan with a departure from RNO, via the Mustang VOR Very High Frequency Omni-directional Radio-range (FMG), airway Victor 200, to Truck intersection, airway Victor 392 to Sacramento VOR (SAC), then direct to Oakland. The pilot filed for an altitude of 12,000 feet.

The briefing included current and forecasted weather for the Reno area, the intended route of flight, and the destination. The briefer advised the pilot that there were no pilot weather reports (PIREP) for the intended route of flight. The freezing level in the Reno area was 6,000 feet with no precipitation. The pilot indicated he might request 14,000 feet once he was airborne.

The Safety Board IIC requested from the FAA transcripts of all communications between the accident pilot and any services provided by the FAA.

The FAA notified the IIC that the Digital Voice Recording System (DVRS) had malfunctioned at some point after February 3, 2005, and was not discovered until February 6, 2005. The malfunction affected the first eight channels of the DVRS, and its ability to record information on those eight channels. The eight channels included the following positions:

- Channel 1 Local 1
- Channel 2 Cab Coordinator
- Channel 3 Ground Control
- Channel 4 Local 2
- Channel 5 Flight Data
- Channel 6 Clearance Delivery
- Channel 7 CIC
- Channel 8 Final Radar

Due to this malfunction, the recordings involving the accident airplane and air traffic control (ATC) were limited to only the communications between the radar sectors and the accident airplane.

The Safety Board IIC reviewed the recordings between the pilot and Oakland Air Route Traffic Control Center (ARTCC), Sector 44. The communications between the pilot and ARTCC were on the frequency of 127.95 MHz. All times were recorded in Coordinated Universal Time (UTC) and converted to Pacific standard time (PST).

The recording started at 1805:45, when the pilot of N286CD reported climbing out of 1,580 feet and climbing to 14,000 feet. ARTCC cleared him to continue the climb to 14,000 feet, which the pilot acknowledged.

At 1807:46, the pilot requested to continue his climb to 16,000 feet to "see if I can get above these clouds." ARTCC cleared him to 16,000 feet.

At 1812:24, N286CD was cleared to fly direct to Sacramento, which the pilot acknowledged.

At 1813:40, the pilot transmits, "Uh, I guess this isn't gonna work, I'm still in the clouds, any chance of lower?" ARTCC tells him to "stand by one."

At 1815:00, the pilot tells ARTCC that if he could go up another 200 or 300 hundred feet, he could get above the clouds. ARTCC asks the pilot, "Do you want to go up or down?" The pilot responds that he would like to go up first, "so I could build up some airspeed if that's okay."

ARTCC clears him to maintain a block altitude between 16,000 and 17,000 feet, and the pilot acknowledged.

About 2 minutes later the pilot transmits, "Uh, I'm coming down six Charlie delta (unintelligible).

"I'm icing up." The controller asked the pilot to repeat his transmission.

At 1817:42, the pilot makes his last transmission, stating, "I'm icing up. I'm coming down."

ARTCC then made numerous attempts to contact N286CD directly, and also requested that other airborne aircraft attempt to contact N286CD.

WRECKAGE AND IMPACT INFORMATION

Investigators from the Safety Board, the FAA, Cirrus Design, Ballistic Recovery Systems (BRS), and Teledyne Continental Motors (TCM) were parties to the investigation and examined the wreckage after it was recovered from the accident scene.

Personnel from the Placer County Sheriff's Search and Rescue team responded to the accident site, documented the accident site, and coordinated the recovery of the wreckage.

The first identified point of contact (FIPC) was a scar on a steep rock face, which led to a scar at the base of the rock face. The debris path was along a magnetic bearing of 156 degrees. The debris field was approximately 175 feet long.

Investigators from BRS examined the parachute and associated components, which were recovered in the Sugar Bowl ski resort area about 4,000 feet north of the accident site.

The BRS investigators determined that the Cirrus Airframe Parachute System (CAPS) parachute assembly had separated from the airplane almost immediately after deployment.

Examination of the parachute revealed that the parachute separated from the airplane under extreme high loads. Both risers were separated from the parachute assembly. The parachute separated from the suspension lines. The ends of the suspension lines were broomstrawed.

The representatives from BRS concluded after the inspection of the BRS system that the extent of damage was consistent with a high-speed deployment. The deployment was outside of the operating envelope of the system. The placarded deployment speed on the Cirrus SR22 is 133 knots indicated airspeed.

MEDICAL AND PATHOLOGICAL INFORMATION

The Placer County Coroner conducted an autopsy on February 9, 2005. The FAA Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing on specimens of the pilot. The results of analysis of the specimens were negative for cyanide and ethanol. The blood sample was unsuitable for analysis of carbon monoxide.

The report contained the following positive results; 25 (mg/dL, mg/hg) isopropanol detected in blood, 3 (mg/dL, mg/hg) isopropanol detected in muscle, 4 (mg/dL, mg/hg) isopropanol detected in heart.

TESTS AND RESEARCH

Investigators from the Safety Board, the FAA, Cirrus Design, Ballistic Recovery Systems (BRS), and Teledyne Continental Motors (TCM) reconvened at Plain Parts, Pleasant Grove, California, to further examine the wreckage on February 10, 2005.

Investigators examined the engine and removed the top spark plugs. All spark plugs were clean with no mechanical deformation. The spark plug electrodes were gray in color, which corresponded to normal operation according to the Champion Aviation Check-A-Plug AV-27 Chart.

A borescope inspection revealed no mechanical deformation on the valves, cylinder walls, or internal cylinder head.

Investigators were unable to rotate the engine due to impact damage. The entire exterior of the engine exhibited impact damage. The alternator, propeller governor, throttle body, manifold valve, cylinder heads numbers 5 and 6, both magnetos, the number 3 intake port, and the number 4 rocker cover had been broken off during the impact sequence. The forward portion of the crankcase was fractured inward. The engine driven fuel pump and the portion of the crankcase that it attaches to both exhibited impact damage. The fuel pump was removed and the drive coupling was broken. All six pistons were intact. Little or no combustion deposits were present on the piston domes and all were light gray in color. The number 6 cylinder head and the right magneto were not recovered. The oil pickup tube screen was clean.

The crankshaft propeller flange was still attached to the aft of the hub. Blade number 1, S/N K12964, exhibited leading edge and trailing edge damage, 45-degree striations, and was bent aft at its root. Blade #2, S/N K12966, exhibited leading edge and trailing edge damage, 45-degree striations, and "S" bending. Blade #3, S/N K12957, exhibited leading edge damage and "S" bending.

ADDITIONAL INFORMATION

The IIC released the wreckage to the owner's representative on August 31, 2005.

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N799TM 20051229

N621PH 20051211

N286CD 20050206

N6057M 20050120

N889JB 20050115

N1159C 20041204

N1223S 20040910

N8157J 20040419

N100BR 20031012

N9523P 20030118

N566T 20021103

SEA05FA038

HISTORY OF FLIGHT

On January 20, 2005, at approximately 2020 Pacific standard time, a Cirrus SR22, N6057M, was destroyed following impact with terrain near Hood River, Oregon. The commercial pilot and his two passengers were fatally injured. Son-Rise Development, Inc., was operating the airplane under Title 14 CFR Part 91. The airplane departed Salem, Oregon, at 1951, and was flying VFR to Hood River, Oregon. Several pilots at Ken Jernstedt Airfield, Hood River, Oregon, said the weather was instrument meteorological conditions at the time of the accident. The flight was estimated to have been 29 minutes in length.

The pilot and his passengers had departed Hood River, Oregon, in the morning of January 20, 2005, for business reasons. On their return flight, ATC (Air Traffic Control) tower personnel at Salem, Oregon, said that the airplane was cleared to taxi at 1945 and it was cleared to takeoff at 1951. Seattle Air Route Traffic Control Center (ARTCC) recordings indicate that the airplane climbed to 3,500 feet, and the pilot attempted to get flight following. He was given a discreet transponder code, but radar could not identify him. At approximately 1957, Seattle ARTCC suggested to the pilot that he change to a VFR transponder code of 1200, and contact Portland approach control. The pilot did change to a 1200 squawk, and he proceeded towards the Columbia River valley at a point approximately 8 to 10 nautical miles (nm) east of Troutdale, Oregon. At 2013:32, Seattle ARTCC recorded the last radar return from the airplane, at 2,500 feet, near North Bonneville, Washington.

Family members reported the airplane overdue; no ELT (Emergency Locator Transponder) signal was ever received. Air and ground search and rescue teams were initiated the next morning. Late in the afternoon, on January 21, a helicopter flying a direct path from North Bonneville, Washington, to the Hood River airport spotted the downed aircraft.

PERSONAL INFORMATION

The pilot's most recent Federal Aviation Administration (FAA) flight medical exam (second class) was on July 31, 2004. FAA records indicate that he had received his Flight Instructors Certificate on June 30, 2004. The pilot's personal flight log-book suggest that he had approximately 1,140 hours of flight experience at the time of the accident. The pilot had completed a Cirrus SR22 initial training course on August 24, 2004.

AIRCRAFT INFORMATION

The airplane was a single engine, propeller-driven, four seat airplane, which was manufactured by Cirrus Design Corporation, in July 2003. The airplane had a maximum takeoff gross weight of 3,400 pounds. It was powered by a Continental IO-550-N7B, six cylinder, reciprocating, horizontally opposed, direct drive, air cooled, fuel injected engine, which had a maximum takeoff rating of 310 horsepower at sea level. Maintenance records indicate that the last annual inspection was completed on August 31, 2004. The airplane's Hobbs meter read 457 hours of flight, at the time of the accident. The owner purchased the airplane on August 30, 2004.

On the day of the accident, the pilot had initially filed an IFR flight plan to The Dalles, Oregon. On that flight plan, he said that he had 5.5 hours of fuel on board. He canceled that flight plan

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before departure; he flew the flight VFR.

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METEOROLOGICAL INFORMATION

N893MK 20020123

At 1953, the weather conditions at Portland-Troutdale Airport (elevation 39 feet), Portland, Oregon, 230 degrees for 28 nm from the accident site, were as follows: wind 080 degrees at 3 knots; visibility 2 statute miles; few clouds at 100 feet, and overcast clouds at 5,000 feet; temperature 51 degrees Fahrenheit; dew point 51 degrees Fahrenheit; altimeter setting 30.05 inches.

N116CD 20010410

One of the pilots at the Hood River airport said "the weather was poor on the night of the accident and that there was a lot of heavy fog in the vicinity of the Hood river airport and the surrounding area."

AIRPORT INFORMATION

The Ken Jernstedt Airfield (elevation 631 feet), Hood River, Oregon, is not serviced by a control tower. The airfield has one runway: 07-25 which is 3,040 feet long and 75 feet wide. The airfield is serviced by a CTAF (Common Traffic Advisor Frequency) of 122.8 MHz.

WRECKAGE IMPACT INFORMATION

The airplane was found (N45 degrees, 41.05'; W121 degrees, 40.75'; elevation 2,150 feet) approximately 100 feet below the top of a steep North-South ridge line which was heavily forested with 100 to 150 foot high conifers. Topped trees, branches, and airplane debris were found on a longitudinal axis of 85 to 90 degrees. The airplane had been shattered into pieces; the cockpit area of the fuselage was identifiable. All of the airplane's major components were accounted for at the accident site. The flight control surfaces were all identified; the flap actuator assembly indicated that they were 50 percent down. There was no postimpact fire.

The external inspection of the engine revealed severe impact damage. The case was broken on the front and rear, and the internal components of the engine were visible. The crankshaft was broken at the #8 long-cheek, and the propeller flange had separated from the shaft. The magneto drive mount bays and top section of the accessory section had separated from the engine. The propeller blades remained attached to their hub, and the hub was still attached to its flange. The blades exhibited cord wise striations, some "S" bending, and one exhibited aft bending.

The parachute of the Ballistic Recovery System (BRS) was found released from its storage envelope; however, the BRS rocket was found unexpended and separated from its firing fuse.

No preimpact engine or airframe anomalies, which might have affected the airplane's performance, were identified.

MEDICAL AND PATHOLOGICAL INFORMATION

The Oregon State Medical Examiner, Clackamas, Oregon, performed an autopsy on the pilot on January 22, 2005. They determined that the cause of death was multiple blunt trauma and sharp force injuries.

The FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma, performed toxicology tests on the pilot. According to CAMI's report (#200500031001), carbon monoxide and cyanide tests were not performed. The pilot's urine was tested for ethanol with negative results; his liver was tested for drugs with negative results.

ADDITIONAL INFORMATION

The airplane, including all components and logbooks, were released to a representative of the

owner's insurance company, on February 4, 2005.

The Fixed Base Operations (FBO) manager at Salem, Oregon, said that the pilot generally flew from the right seat, and the owner of the airplane would occupy the left seat. Due to the time of their departure, on the day of the accident, he did not know who was in which seat during the accident flight. According to friends of the pilot and passenger, at the Troutdale Airport, the pilot and the owner of the airplane flew a similar business flight one or two days before January 20. On that day the weather was also very marginal, and according to these friends, the airplane landed there and the two men drove on to Hood River in the airport courtesy car.

The FBO manager at Salem, Oregon, said that the pilot spent much of the day at the FBO waiting for the owner to finish his business. During this time he checked the weather many times. The pilot also told him about "scud running" into Hood River Airport, and he had done so on several occasions. The pilot said that sometimes he would fly the instrument approach to The Dalles, Oregon, and then fly the 20 miles down the river to the Hood River Airport. The FBO manager said that he advised the pilot not to fly into Hood River Airport that night, because the weather was deteriorating.

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N1159C 20041204

N1223S 20040910

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N100BR 20031012

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HISTORY OF FLIGHT

On January 15, 2005, at 1223 eastern standard time, a Cirrus Design Corporation SR22, N889JB, was destroyed when it impacted a house, then terrain, in Coconut Creek, Florida. The certificated commercial pilot was fatally injured. Instrument meteorological conditions prevailed, and the airplane was operating on an instrument flight rules flight plan from Fort Lauderdale Executive Airport (FXE), Fort Lauderdale, Florida, to Naples Municipal Airport (APF), Naples, Florida, and back to Fort Lauderdale Executive. The personal flight was conducted under 14 CFR Part 91.

According to information received from the Federal Aviation Administration (FAA), the airplane departed Fort Lauderdale Executive at 1217.

Radar and transponder data revealed that after the airplane departed Fort Lauderdale Executive, it climbed to the northwest, to 1,600 feet, before beginning a right turn toward the northeast. The airplane then climbed to 1,800 feet, continued the right turn, and once on a southeast heading, descended to 1,000 feet. Subsequently, the airplane turned left, and headed northeast, climbing to 1,900 feet. It then made a right turn to the south, and descended to 400 feet during a 12-second period, followed by a climb to 1,400 feet during the next 12-second period. The airplane subsequently made one more left turn, through north, to the northwest, and its last altitude readout, at 1223:17, was 1,100 feet. The last radar contact was about 500 feet southeast of the accident site.

A review of the voice communication tape revealed:

At 1219:13, the pilot stated: "cirrus november eight eight nine juliet bravo is through a thousand, ah (unintelligible)."

At 1219:59, the controller responded: "eight eight niner juliet bravo you're radar contact, turn left heading two seven zero." The pilot then responded with: "ah, two seven zero, nine zero, ah, nine juliet bravo."

At 1220:07, the controller stated (to another pilot): "seven eight five, turn right, heading zero niner zero."

At 1220:10, an unidentified voice, similar to the accident pilot's, responded: "ah, did you say a right turn to two seven zero?"

At 1220:15, the controller stated: "turn right zero niner zero seven eight five."

The pilot from that airplane did not respond.

At 1220:21, the controller stated: "three six seven eight five, turn right heading zero niner zero."

At 1220:27, there was a sound similar to two pilots blocking each other's transmissions.

At 1220:29, the controller stated: "eight juliet, correction, niner juliet bravo, turn left, two seven zero."

N901CD 20020528

At 1220:32, the pilot responded: "two seven zero for nine juliet bravo"

N837CD 20020424

At 1220:35, the controller stated: "turn now please."

N893MK 20020123

At 1220:39, the controller stated: "november six niner xray, turn left, heading one five zero," and that pilot responded with: "one five zero, six niner xray."

N116CD 20010410

At 1220:43, the controller stated: "november nine juliet bravo, turn left, heading two seven zero, two seventy the heading niner juliet bravo. you've turned the wrong way."

At 1220:49, the pilot responded: "you told me to turn ninety; i'm turning back to two seventy now."

At 1220:52, the controller stated: "negative sir, that was for a seven eight five. november niner juliet bravo, continue in the turn heading of zero niner zero. traffic alert. traffic eleven o'clock, one mile, indicates two thousand, he's southbound."

At 1221:06, the pilot responded: "zero nine zero on the heading, nine juliet bravo."

At 1221:13, the controller stated: "november niner juliet bravo, just continue on a ninety heading. november six niner xray, turn right, heading of zero, correction, turn right, heading two seven zero." That pilot responded: "two seven zero, six niner x."

At 1221:25, the controller stated: "november seven eight kilo, turn left, turn left, heading zero niner zero, maintain three thousand," and the pilot responded: "zero nine zero, seven eight kilo."

At 1221:30, the controller stated: "cirrus niner juliet bravo, climb and maintain two thousand, over."

At 1221:35, the pilot responded: "climbing to two thousand (pause), and you want me (transmission cut off)."

At 1221:40, the controller stated: "november niner juliet bravo, just continue on a ninety heading, heading zero niner zero. i'm trying to get you away from a cessna."

There was no response from the pilot.

At 1221:50, the controller stated: "november niner juliet bravo, fly heading zero niner zero, over."

There was no response from the pilot.

At 1221:59, the controller asked: "november eight eight niner juliet bravo, how do you hear, over?"

At 1222:05, the pilot responded: "i'm hearin' ya. i'm hearin' ya. i'm, i'm, i gotta get, ah, my act together here."

At 1222:11, the controller stated: "november niner juliet bravo, fly heading zero niner zero. i have aircraft off your left, will be on the approach at pompano. just fly a ninety heading, climb and maintain two thousand."

There was no answer from the pilot.

At 1222:30, the controller stated: "seven eight kilo, turn left, three six zero, it's going to be a short vector, i've got a cirrus disorientated out to the of, ah, east of you. i have to get him under control again." That pilot responded: "three six zero, seven eight kilo."

At 0222:39, the controller stated: "thank you. november seven eight five, turn right, heading one eight zero. this will be vectors across the localizer for aircraft that's just going to be coming across pompano at two thousand feet." There was no response from that pilot.

At 1222:52, the controller asked: "cirrus eight eight niner juliet bravo, miami, how do you hear?"

At 1222:55, the pilot responded: "i hear you, but i've got, i've got problems, i've got avionics problems."

At 1223:02, the controller stated: "cirrus niner juliet bravo, roger. do you have a gyro?"

At 1223:07, the pilot responded: "i'm trying to get the plane, ah, level, nine juliet bravo."

At 1223:11, the controller asked: "okay, november niner juliet bravo, do you see the ground?"

At 1223:16, the pilot responded: "negative, I do not see the ground, nine juliet bravo."

At 1223:21, the controller asked: "all right, you have your wings level?"

At 1223:23, the pilot responded: "the wings are level, nine juliet bravo."

At 1223:24, the controller asked: "november niner juliet bravo, roger, do you have a directional gyro?"

At 1223:28, the pilot stated: "i'm losin', i'm losin' it again here."

There were no further transmissions from the pilot.

A witness, an airline transport pilot who was at a park near the accident site, reported that he heard the airplane flying southeast at a very low altitude. He looked up, but couldn't see it through the low overcast and mist. The airplane didn't sound like it had any engine problems, but as it flew farther away, it sounded as if it was maneuvering.

A second witness, who was outside his home near the accident site, stated that he heard an airplane above the clouds that sounded like it was conducting acrobatics, climbing and descending. Suddenly, it descended out of the clouds, then banked and headed back up into the clouds in a northeasterly direction. As it ascended, the witness heard "an rpm change, like it was climbing." The witness then heard the engine get louder, followed by the sound of an explosion. The witness did not see the airplane exit the clouds a second time due to trees in his line of sight.

Another witness, who did see the airplane descend from the clouds the second time, stated that when it did so, the airplane was perpendicular to the ground, "but on a slant."

The accident occurred during daylight hours, in the vicinity of 26 degrees, 15.5 minutes north latitude, 080 degrees, 10.4 minutes west longitude.

PILOT INFORMATION

The pilot held a commercial pilot certificate. According to notations in his logbook, the pilot obtained his private pilot certificate on June 1, 2003, his instrument rating on October 6, 2003, and his commercial certificate on March 25, 2004.

The pilot had logged 483 hours of flight time, with 405 hours between two SR22s. He began flying the first SR22, N97CT, on June 5, 2003, and logged 304 hours in it. He began flying the accident SR22 on June 2, 2004.

The pilot had also logged a total of 15 hours of actual instrument time, and 61 hours of simulated instrument time. His last flight before the accident flight was 1.6 hours on January 7, 2005, in which he also logged one instrument approach and 0.2 hours of actual instrument time.

On December 30, 2004, the pilot logged a flight in which he flew two ILS, one VOR, and one GPS approach. According to the flight instructor on that flight, one of the approaches was flown partial panel, without the PFD. The flight instructor also noted that it wasn't the first time they had practiced partial panel; they had done it a number of times previously.

The pilot's latest FAA first class medical certificate was issued on April 16, 2004.

AIRPLANE INFORMATION

The airplane was manufactured in 2004, and was equipped with an Avidyne FlightMax Entrega-Series Primary Flight Display (PFD). Information provided by the PFD included airplane attitude, airspeed, heading and altitude, a horizontal situation indicator, and a vertical speed indicator.

Below the PFD, on a "bolster panel" in front of the pilot, were backup altimeter, airspeed, and attitude indicators, to be used "in case of total or partial PFD failure."

The airplane was also equipped with a Cirrus Airplane Parachute System (CAPS).

According to the SR22 Pilot's Operating Handbook:

"CAPS [is] designed to bring the aircraft and its occupants to the ground in the event of a life-threatening emergency. The system is intended to save the lives of the occupants but will most likely destroy the aircraft and may, in adverse circumstances, cause serious injury or death to the occupants."

"CAPS is initiated by pulling the activation T-handle installed in the cabin ceiling on the airplane centerline just above the pilot's right shoulder. A placarded cover, held in place with hook and loop fasteners, covers the T-handle and prevents tampering with the control. The cover is removed by pulling the black tab at the forward edge of the cover. Pulling the activation T-handle will activate the rocket and initiate the CAPS deployment sequence. To activate the rocket, two separate events must occur:

1. Pull the activation T-handle from its receptacle. Pulling the T-handle removes it from the o-ring seal that holds it in place and takes out the slack in the cable (approximately two inches of cable will be exposed). Once the slack is removed, the T-handle motion will stop and greater force will be required to activate the rocket.
2. Clasp both hands around [the] activation T-handle and pull straight downward with a strong, steady, and continuous force until the rocket activates. A chin-up type pull works best. Up to 45.0 pounds [of] force, or greater, may be required to activate the rocket. the greater force required occurs as the cable arms and then releases the rocket igniter firing pin. When the firing pin releases, two primers discharge and ignite the rocket fuel."

There were no flight data or cockpit voice recording devices installed on the airplane.

MAINTENANCE INFORMATION

The airplane had been primarily maintained at two maintenance facilities, one in Georgia, and one in Florida.

According to maintenance records, the PFD was replaced on June 4, 2004, at 12.2 hours, on September 14, 2004, at 55.2 hours, and on December 20, 2004, at 80.6 hours.

According to customer invoices:

The original PFD was replaced in June 2004 at the Cirrus Design Factory Service Center, due to "failure of altimeter and VSI." The replacement unit was listed as serial number 1153.

The second unit was replaced in September 2004 at the Georgia maintenance facility because "PFD VOR knob only changes 2-3 degrees." PFD serial number 21602354 was then installed.

In October 2004, the airplane was at the Florida maintenance facility for installation of an air conditioning system.

In December 2004, the last PFD change-out occurred, at the Georgia maintenance facility. The invoice stated: "PFD red X on ADI...Removed PFD for repair. Found that PFD serial number D1433 did not match the serial number that was supposed to be in the aircraft. Contacted customer and he stated that the aircraft had been in Florida for A/C installation and that they had broken the pitot and static fittings, and swapped units with no logbook entry. The customer contacted the Florida shop and they found the unit in their parts room. They [the Florida facility] sent the unit to Avidyne for repair, and Avidyne sent the unit to [the Georgia facility] for reinstallation." The reinstalled unit was listed as serial number 21602354.

METEOROLOGICAL INFORMATION

Fort Lauderdale Executive Airport was located about 4 miles to the south of the accident site. Weather, recorded there at 1153, included winds from 340 degrees true, at 4 knots, surface visibility 10 statute miles, and an overcast cloud layer at 600 feet.

Weather, recorded at 1253, included winds from 310 degrees true, at 5 knots, surface visibility 5 statute miles, light rain and mist, and an overcast cloud layer at 600 feet.

WRECKAGE AND IMPACT INFORMATION

The airplane's wreckage was located in a back yard of one house, next to another house. The right wing tip was broken off in the roof of the second house. The wreckage, which displayed no ground impact marks consistent with forward motion, was consumed in a post-impact fire.

All flight control surfaces were accounted for at the scene, and control cable continuity was confirmed from the cockpit, to where all flight surface attach points would have been.

The engine sustained impact damage. The three-bladed propeller, and the front of the engine, including the crankshaft to just aft the number six connecting rod, were separated from the rest of the engine and buried in the ground. One of the propeller blades was broken off about 5 inches from the hub, another blade exhibited deep chordwise scratching, and the third was bent aft.

There was no evidence of any pre-impact anomaly to either the engine or airframe. All flight instruments were destroyed in either the ground impact or the post-impact fire.

The CAPS parachute bag extended, by attached risers, about 40 feet from the wreckage, and came to rest in front of a fence. The parachute was still in the parachute bag. The CAPS cover was located near the airplane, and exhibited a circular impact mark on the inside, consistent with rocket activation. The primers had also been fired. The rocket motor and lanyard were found near the parachute bag.

The CAPS T-handle safety pin was found in the wreckage, away from the T-handle, with its red safety flag wrapped around it. The T-handle was found pulled out of its housing by about 2 1/2 inches; however, it could not be determined if the pilot had pulled it, or if it had been displaced by impact forces.

Total operating time of the airplane could not be exactly determined due to the condition of the wreckage. However, the estimated total time on the airplane was approximately 98 hours, based on the last maintenance logbook entry, the pilot's subsequent flight logbook entries, and the duration of the accident flight.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was conducted on the pilot at the Broward County Medical Examiner's Office, Fort Lauderdale, Florida, and toxicological testing was subsequently performed at the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma.

ADDITIONAL INFORMATION

On January 16, 2005, the wreckage release was acknowledged by the vice president of the aircraft recovery company.

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HISTORY OF FLIGHT

On December 4, 2004, approximately 1530 mountain standard time, a Cirrus SR22 airplane, N1159C, impacted mountainous terrain while maneuvering about 10 nautical miles northeast of Belgrade, Montana. The commercial pilot and two of the three passengers were killed. The other passenger received serious injuries. The airplane, which was registered to Flightline Fractionals Inc. and operated by the pilot, was destroyed. The local personal flight was conducted under 14 CFR Part 91. Visual meteorological conditions prevailed, and no flight plan was filed. The airplane departed from Gallatin Field Airport, Belgrade, Montana, at 1518.

At the time of the accident, a motor glider was flying near the area where the accident occurred. The pilot of the motor glider was interviewed by the NTSB investigator-in-charge and reported that he was giving a ride to a friend of the pilot of the accident airplane. Prior to departing from Gallatin Field, the motor glider pilot spoke with the pilot of the accident airplane, who told him that he would get the airplane out, takeoff, catch up with the glider and make some "flybys" of the glider. The motor glider pilot said that after takeoff, he remained on the tower frequency and heard the airplane depart. The pilots of both aircraft then tuned their radios to an air-to-air frequency and established communications.

The motor glider had shut down and stowed his engine and was soaring north along the western edge of the Bridger mountain range nearing Sacagawea Peak. The airplane made one pass above the glider, circled and made a second pass immediately to the left of the glider. When the airplane passed by the glider, it was "in coordinated flight," with the flaps up, and it was either flying level or descending slightly. The glider pilot watched the airplane continue heading north "straight out in front of him" for about 5 to 10 seconds. Since the glider was losing lift, he then made a turn to the south.

At the time the glider pilot last saw the airplane, it was heading towards a transverse "foothills ridge" that runs downward from the summit of Sacagawea Peak (elevation about 9,600 feet) towards the west and then hooks toward the south. There is a peak (elevation about 8,916 feet) on the transverse ridge at the point where it hooks south. According to the glider pilot, this ridge is unique compared to the rest of the transverse ridges coming off the crest of the Bridgers in that it "does not fall away like the rest of the foothills." The combination of the crest of the Bridger range and this transverse ridge form a cirque or bowl that is open to the south and has high terrain to the west, north and east.

After gaining altitude, the glider pilot turned back to the north. He then saw a column of black smoke, which was later identified as being from the crash site. The column of smoke was located just south of the 8,916-foot-peak on the transverse ridge. It was 5 minutes between the time the glider pilot last saw the airplane and the time he turned back north and spotted the smoke. The glider pilot reported that the weather was clear blue sky, no turbulence, "no sucking downdrafts," but some "down air" in the area where he last saw the airplane.

The glider pilot analyzed the data recorded in the glider's flight logger for his flight on the day of the accident. His analysis indicated that when the airplane passed the glider on its second pass, the glider was at an altitude of about 8,900 feet, had a ground speed of about 57 knots, and the time was about 1529:30. About 90 seconds later, he made his turn back to the south. When he made the turn, he was about 500 yards from the crash site, at altitudes between

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9,100 and 9,200 feet, in the bowl formed by the crest of the Bridgers and the transverse ridge. During the turn, he encountered an air mass that was sinking about 100 to 200 feet per minute, and the glider lost about 50 feet of altitude.

The surviving passenger was interviewed on December 15, 2004, by the NTSB investigator-in-charge (IIC) and an FAA inspector. The passenger was not a rated pilot or aircraft mechanic, but had gotten involved in working on airplanes when he was in high school. He explained that he flew frequently with different pilots at the airport "when he got the chance." This was his first flight in a Cirrus and his first flight with the pilot. The passenger reported that he was seated in the left rear seat and that all four occupants had headsets on, and they could talk with each other and also hear the transmissions on the airplane's communication radio. He further reported that there were no problems with the airplane during the run up or takeoff. After departing the airport, they headed directly towards the mountains to meet the glider. When they spotted the glider, it was considerably to their left. They crossed behind the glider at its altitude, continued over the crest of the Bridgers and made a "big swooping left turn." They crossed back over the crest of the Bridgers and passed in front of and above the glider. They "had a smooth ride the whole flight. There was very little wind shear even when they crossed over the ridge crest."

According to the surviving passenger, the pilot leveled out the airplane, and they turned back to the right to get behind the glider. They were climbing "to bleed off speed." The passenger could not see the glider as they were still in a right bank, and to see the glider, he would have had to be able to see through the roof of the airplane. The airplane was positioned behind and left of the glider, and it was "in a light climb." The stall warning indicator came on in the airplane. When this happened, there was no discussion about it between the pilot and the right front seat passenger, who was also a pilot. The surviving passenger heard the engine pick up speed. The stall warning continued to buzz. The third passenger, who was seated in the right rear seat and who was also a pilot, said, "isn't that your stall buzzer?" and the pilot replied, "yeah." The pilot dropped the nose to level out, and the stall warning indicator stopped sounding. The passenger heard a noise that sounded like the flaps were going down. He looked out and saw that the flaps were not moving. He could not see the pilot moving the flap control; he just heard the noise, there was no conversation about it. The sound he heard was a high-pitched whine, and it sounded like what he had heard during the preflight check.

The passenger stated that the left wing dropped and they "started going down hill. It felt like what had happened before during the flight as they turned to stay with the glider. It felt like the airplane was under control." The pilot turned and said, "hang on, we might get a couple of trees on this one." The pilot's tone of voice was "totally normal." At this point, the nose was "somewhat up," the passenger was looking forward, and he could not see trees. It was about 10 to 15 seconds from the time the stall warning horn stopped sounding until they hit the trees. He heard a few bumps like the landing gear was hitting something. Then they hit something hard and he was "slung way forward." His next recollection was waking up laying on bare ground.

PERSONNEL INFORMATION

The pilot, who was seated in the left front seat, held a commercial pilot certificate with airplane single and multi-engine land and instrument ratings. Additionally, he held a flight instructor certificate with airplane single engine land and instrument ratings. He held a first class medical certificate dated May 18, 2004, with the limitation, must wear corrective lenses. On the application for his most recent medical certificate, the pilot reported that he had accumulated 1,250 hours total flight time with 400 hours flown in the past six months. On August 29, 2004, the pilot completed a Cirrus factory authorized transition course. On November 15, 2004, the pilot completed a Cirrus standardized instructor course. On the application form for the standardized instructor course, the pilot reported that he had accumulated 1,561 hours total flight time of which 105 hours were as pilot in command of a Cirrus SR22.

The passenger, who was seated in the right front seat, held an airline transport pilot certificate with an airplane multiengine land rating, type ratings in B-727, B-737, B-757, B-767, DA-20 and DA-2000 airplanes, and commercial privileges in single engine land and sea airplanes and gliders. Additionally, he held a flight instructor certificate with airplane single and multi-engine land and instrument ratings. He held a second class medical certificate dated September 29, 2004, with the limitation, may wear contact lenses while flying. On the application for his most recent medical certificate, the passenger reported that he had accumulated 20,000 hours total flight time with 50 hours flown in the past six months.

AIRCRAFT INFORMATION

Examination of the airplane's maintenance records indicated that the airplane was manufactured in 2003 and received its most recent annual inspection on November 24, 2004, at a total airframe time of 388.3 hours. As of that date, the engine, a Continental IO-550N7B, S/N 686803, had accumulated 388.3 hours since new. Review of the maintenance records revealed no evidence of any uncorrected maintenance discrepancies.

According to the pilot who flew the airplane just prior to the accident flight, she experienced no problems with the airplane during her 1.2 to 1.3 hour flight. She stated that the flaps worked normally during the four takeoffs and landings she made during her flight. She estimated that the airplane had 28 to 30 gallons of fuel remaining at the conclusion of her flight.

The weight and balance of the airplane at takeoff was estimated using the following information: basic empty weight 2,353 pounds, front seat occupants 375 pounds, rear seat occupants 296 pounds, baggage 10 pounds, fuel 180 pounds (30 gallons). The estimated takeoff weight was 3,205 pounds, which was below the maximum takeoff weight of 3,400 pounds. The estimated takeoff moment was 464.276/1000 (pound-inches/1000), which was within the allowable moment range for the calculated takeoff weight. (At 3,200 pounds, the allowable moment range is 452/1000 to 474/1000.)

According to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for the Cirrus Design SR22, takeoffs are approved with flaps up or at 50% and normal landings can be made with any flap setting desired.

METEOROLOGICAL INFORMATION

At 1456, the reported weather conditions at Gallatin Field Airport were wind calm, visibility 10 statute miles, sky clear, temperature 3 degrees C, dew point -6 degrees C, and altimeter setting 29.69 inches. At 1556, the reported weather conditions at Gallatin Field Airport were wind calm, visibility 10 statute miles, scattered clouds at 12,000 feet, temperature 2 degrees C, dew point -6 degrees C, and altimeter setting 29.68 inches.

WRECKAGE AND IMPACT INFORMATION

The accident site was located in rugged mountainous terrain at 45 degrees 54.055 minutes North latitude and 110 degrees 58.802 minutes West longitude. According to measurements taken by personnel with the Gallatin County Sheriff's Department (GCSD), the airplane impacted trees at an elevation of 8,553 feet on a heading of 236 degrees true and came to rest about 360 feet past the initial impact point. Examination of photographs taken by GCSD personnel and recovery personnel indicated that the outboard section of the left wing, the right wingtip, the engine, the empennage, the right main landing gear, a portion of the floor with the aft passenger seats attached and other miscellaneous pieces separated from the fuselage during the impact sequence. These separated pieces were not damaged by fire. The forward section of the fuselage and the majority of the wings were consumed by fire.

The wreckage was recovered from the accident site on December 6, 2004, and examined on December 15, 2004, by the NTSB investigator-in-charge and representatives of Cirrus Design

Corporation, Teledyne Continental Motors, and the FAA. All cockpit instruments and avionics were destroyed by fire. The flight controls and stabilizers were accounted for to include left and right ailerons, left and right flaps, left and right horizontal stabilizers and elevators, the vertical stabilizer and the rudder. Flight control continuity could not be confirmed due to the extent of damage. The flap actuator motor was recovered, and measurements showed the actuator to be in the flaps up / zero degrees position when compared with a flap actuator measured at the factory. Functional testing of the flaps was precluded by impact and fire damage.

The engine was intact with the starter separated and the alternator partially separated. The propeller remained attached to the crankshaft. One blade was loose in the hub, twisted toward the direction of rotation and displayed leading edge impact marks. The second blade was wrinkled and twisted toward the direction of rotation. The third blade was loose in the hub, had "S" type bending, and the tip was folded back over the non-cambered side of the blade. The throttle, mixture and propeller controls remained attached. The throttle shaft was bent, and the throttle valve was frozen in place. The intake sides of the number three and five cylinder heads were separated. The top spark plugs and valve covers were removed, the crankshaft was rotated, and continuity was confirmed to cylinders one, two, four and six and to the rear of the engine. The pistons in cylinders three and five were observed to move. Good hand compression was obtained on cylinders one, two, four and six.

The magneto timing was checked, and the right and left magnetos were found to be timed at 22 and 24 degrees before top dead center, respectively. Both magnetos sparked at all terminals when rotated. The spark plugs showed normal wear when compared to the Champion Check A Plug card. The fuel pump had impact damage on the rear side, and the mixture control was damaged. The drive coupling was not damaged. The pump was rotated with a drill motor and fuel was pumped through the unit. The fuel manifold was disassembled and fuel was found in the interior; the diaphragm and spring were intact and undamaged, and the fuel screen was clean. The number five fuel injector nozzle was missing. The other nozzles were undamaged, clean and clear. The oil filter was cut open, and the element was clean with no metal deposits.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies of the pilot and the pilot rated front seat passenger were conducted by a pathologist associated with Yellowstone Pathology Institute, Inc., of Billings, Montana. The cause of death for both individuals was traumatic injury. Toxicology tests on both individuals were conducted by the FAA's Toxicology and Accident Research Laboratory. The pilot's test results were negative for carbon monoxide, cyanide, ethanol and drugs. The pilot rated passenger's test results were negative for ethanol and drugs; tests for carbon monoxide and cyanide were not performed.

SURVIVAL ASPECTS

The surviving passenger (left rear seat) reported that after the crash, he woke up laying on bare ground about 25 feet from his seat. The passenger in the right rear seat was still strapped into the seat and was clearly deceased. Part of the fuselage in front of him was burning, and he heard burning behind him, but he did not look behind him. He was wearing a t-shirt, no coat, and deck shoes. He was missing his right shoe, his glasses and his hat. It was freezing cold. He knew that he could find a road if he went downhill, so he started down, plowing through snow. Near dark, he stopped and went into a grove of trees and started to make a shelter. He heard a helicopter and started out of the trees into an open field. By the time he got into the open, the helicopter was gone. He waited in the middle of the field and in about 5 minutes, the helicopter came back, saw him, landed and picked him up. His injuries included frostbite, cuts and bruises to his right foot, burns on his forearms, face and the backs of his hands, and a pelvic hernia. He was wearing his seatbelt and shoulder harness, and he had bruises from both shoulder straps.

ADDITIONAL INFORMATION

The wreckage was released to a representative of the owner on December 28, 2004.

In a letter dated February 1, 2005, an attorney representing the surviving passenger wrote that the passenger told him "that before take off the pilot indicated the flaps on the aircraft were not functioning." On March 22, 2005, the NTSB IIC conducted a follow-up phone interview with the surviving passenger. During this interview, the passenger stated that while they were sitting in the airplane before takeoff, the pilot mentioned that the flaps were not working. This took place during the running of the electronic checklist. None of the passengers questioned the pilot about the flaps. The passenger heard a high-pitched whine (like the sound he heard during the flight just before the crash) at some point during the time the pilot was running the electronic checklist. He could not recall whether this happened before or after the pilot's comment about the flaps not working. The passenger stated that he was sure the flaps were not down for takeoff, since he recalls the pilot and the right front seat passenger discussing the need for extra speed on the takeoff roll.

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N889JB 20050115

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N9523P 20030118

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CHI04FA255

HISTORY OF FLIGHT

On September 10, 2004, about 1200 central daylight time, a Cirrus Design Corporation model SR-22, N1223S, piloted by a private pilot and a certified flight instructor (CFI), was destroyed when it impacted a river near Park Falls, Wisconsin. The airplane came to rest in the Flambeau River about 1,000 feet from the approach end of runway 18 at the Park Falls Municipal Airport (PKF). The 14 CFR Part 91 personal flight was operating in visual meteorological conditions without a flight plan. The pilot was fatally injured and the flight instructor received serious injuries. The airplane departed the Sheboygan County Memorial Airport (SBM), Sheboygan, Wisconsin, at an unconfirmed time. The airplane's final intended destination was the Duluth International Airport (DLH), Duluth, Minnesota.

According to a witness report to local authorities, the airplane was banking to the left and heading east when visual contact was lost as it descended below a tree line.

Another witness reported that he saw the airplane approaching from the north heading in a southwesterly direction when it made a left turn. The witness reported that the airplane appeared to level briefly and then began a second banking maneuver to the left. The witness reported that the second banking maneuver was at a much steeper angle than the previous maneuver. He also reported that the airplane appeared to be descending during this maneuver. He reported that just prior to losing sight of the airplane behind a tree line, he saw the tail of the airplane "kick straight up" in the air.

Several witnesses reported hearing the engine sound increase prior to hearing the sound of the impact.

A report filed by the CFI stated that he had completed a week of flight training with the left seat pilot. He stated that the purpose of the accident flight was to return the CFI to his home in Duluth, Minnesota. He stated that the day of the flight was windy and a decision was made to fly from SBM to DLH with landings at only those airports. He stated that he had no memory of the accident or why the airplane was diverting to PKF.

PERSONNEL INFORMATION

The left seat occupant held a private pilot certificate with an airplane single-engine-land rating. The certificate was issued on September 4, 2004. He also held a third class medical certificate issued on August 17, 2004. The medical certificate listed a limitation that the pilot wear corrective lenses.

A review of the pilot's logbooks found within the accident airplane showed that he had accumulated 185.1 total hours of flight experience which included 11.9 hours in the accident airplane. All of the recorded flight time subsequent to the pilot receiving his private pilot certificate was in the accident airplane.

The CFI held a commercial pilot certificate with airplane single-engine land, multi-engine land, and instrument airplane ratings. He also held a certified flight instructor certificate with airplane single-engine and instrument airplane ratings. His second-class medical certificate was issued in August 2004 and listed the limitation that he wear corrective lenses. A report filed by the

N901CD 20020528

right seat pilot listed a total of 1,895 total hours of flight experience, with 600 hours in the same make and model as the accident airplane.

N837CD 20020424

AIRCRAFT INFORMATION

N893MK 20020123

The airplane was a Cirrus model SR22, serial number 0105, single engine, four seat airplane with fixed tricycle landing gear. The airplane was a low wing monoplane with a fiber reinforced composite primary structure. The airplane was fitted with a Cirrus Airframe Parachute System (CAPS) as standard equipment. The CAPS is a rocket-deployed parachute intended to lower the entire airplane to the ground in the event of an emergency.

N116CD 20010410

A Teledyne Continental Motors model IO-550-N engine, serial number 685853, rated at 310 horsepower powered the airplane.

METEOROLOGICAL INFORMATION

The recorded weather for the Price County Airport, 15 nautical miles south of the accident site, at 1155 was: Wind 170 degrees at 15 knots gusting to 18 knots; Visibility 10 statute miles; Sky condition clear; Temperature 23 degrees Celsius; Dew Point 15 degrees Celsius; Altimeter setting 30.08 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest in the Flambeau River at coordinates 45.9618 degrees north latitude, 90.4222 degrees west longitude. The CAPS system had not been activated. Prior to removal from the water, a representative of the aircraft manufacturer disarmed and removed the CAPS rocket for later disposal. The airplane was facing in a easterly direction in the water. The top of the cabin, the vertical stabilizer, and the horizontal stabilizer were visible at or above the waters surface. The remainder of the airplane was submerged.

The airplane was removed from the river as a unit and placed in a hangar for further examination. The forward fuselage was separated from the aft fuselage at the control panel. The wing was partially separated from the aft portion of the fuselage. The main landing gear remained attached to the wing structure. The nose landing gear, which was integral to the tubular engine mount, was intact. The tail surfaces remained attached to the aft fuselage. The airplane's engine was separated from the firewall with the fuselage hard points remaining attached to the tubular engine mount.

The aircraft flight controls were examined and the ailerons remained attached to the wings with all hinges intact. The rudder and elevator remained attached to the vertical and horizontal stabilizers respectively. All tail surface hinges were intact. The right flap remained attached to the wing with the center hinge intact. The inboard and outboard hinges remained attached to the wing and were separated from the flap. The left flap remained attached to the wing with the outboard and center hinges intact. The inboard hinge remained attached to the wing and was separated from the flap. Examination of the control system confirmed cable continuity from the control surfaces to their respective controls within the cockpit.

No pre-impact deficiencies were found with respect to the airframe or its systems.

The airplane's engine was found to rotate. Compression and suction were verified at all cylinders. The engine was shipped to the manufacturer's facility to attempt a test run in an instrumented engine test cell. The engine run was conducted under the supervision of a National Transportation Safety Board investigator. The engine was examined prior to installation in the engine test stand. This examination revealed rust and corrosion on internal components consistent with submersion in water during the accident sequence. Preservative oil was used to free the engine prior to the engine run. The contact points on the right magneto were also found to be corroded and were replaced. Subsequently, the engine was installed on the test stand with an appropriate test propeller and the operational test performed. During the

engine run, the engine achieved 2,880 rpm at 27.5 inches of manifold pressure. No pre-impact deficiencies were detected during the engine run.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the left seat pilot by the Sacred Heart Hospital, Pathology Department, Eau Claire, Wisconsin.

A Final Forensic Toxicology Fatal Accident Report, prepared by the Federal Aviation Administration (FAA), listed negative results for all tests performed.

ADDITIONAL INFORMATION

During a telephone conversation with the wife of the deceased pilot, she informed the NTSB investigator in charge that her husband was to fly the flight instructor to Duluth, Minnesota, and that they were to practice emergency procedures while en route. The wife was not aware of any specific emergency procedures that were to be practiced.

The FAA, Cirrus Design Corporation, and Teledyne Continental Motors were parties to the investigation.

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N526CD 20060109

N799TM 20051229

N621PH 20051211

N286CD 20050206

N6057M 20050120

N889JB 20050115

N1159C 20041204

N1223S 20040910

N8157J 20040419

N100BR 20031012

N9523P 20030118

N566T 20021103

ATL04FA096

HISTORY OF FLIGHT

On April 19, 2004, at 1400 Eastern Daylight Time, a Cirrus SR20, N8157J, registered to Attic Aircraft Leasing LLC, and operated by Aero Atlantic Flight Center, as a 14 CFR Part 91 business flight, collided with trees and ground after departing Greenwood Airport, Greenwood, South Carolina. Visual meteorological conditions prevailed and no flight plan was filed. The airplane was destroyed and a post crash fire ensued. The private pilot and three passengers received fatal injuries. The flight originated from the Greenwood Airport on April 19, 2004, at 1400.

A private pilot stated he was on a cross-country flight from Dover A.F.B. to Eglin A.F.B. and he had stopped at Greenwood, South Carolina for fuel. He observed the accident airplane taxi out and depart from runway 27. The takeoff roll was long and the airplane lifted off the ground in "ground effect." The airplane remained about 10 to 15 feet above the runway and continued at that altitude all the way down to the end of the tree line off the departure end of the runway. "The aircraft suddenly pitched up at a steep angle to an altitude of about 300-400 feet. The aircraft then slowed and appeared to experience a departure stall rotating about 175-degrees on its vertical axis to the left. About half way down from the 175-degree rotation point he observed a slight pitch up of nose, and then aircraft entered a near vertical dive to the left. The aircraft went out of sight behind tree line, then he heard two consecutive loud bangs followed by fire ball, and black smoke a few seconds later."

An airframe and power plant mechanic located at the Greenwood Airport, stated he observed the accident airplane taxiing to runway 27 with both doors open, and the flaps in the retracted position. The airplane taxied onto the active runway and departed without conducting an engine run-up.

Another witness stated he was playing golf at a local golf course located off the departure end of runway 27 at the Greenwood Airport. He heard the sound of an airplane engine sputtering; he looked in the direction of the sound and observed the airplane spinning to the ground in a nose down attitude to the left. The airplane made about two or three turns to the left before it collided with trees, ground, and burst into flames. He immediately telephoned the 911 emergency operator and reported the accident.

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 on October 15, 2002, with ratings for airplane single engine land, airplane multiengine land, and instrument airplane. The pilot held a third class medical certificate issued on September 18, 2002, with no restrictions. The pilot reported he had accumulated 500 total flight hours on the application for the third class medical certificate. The pilot attended Cirrus SR20 training at Aero Atlanta Flight Center from December 10, 2003, through January 8, 2004. The pilot received 5.5 hours of ground school and 6 hours of dual instruction. The pilot's last biennial flight review was on October 15, 2002. According to Aero Atlanta Flight Center, the pilot had between 50 to 100 hours in the SR20 airplane.

AIRCRAFT INFORMATION

N901CD 20020528**N837CD 20020424****N893MK 20020123****N116CD 20010410**

Review of the aircraft records revealed the last 100-hour inspection was conducted on March 30, 2004, at Hobbs time 280.1. According to the aircraft operator the airplane was last flown on April 18, 2004, and the Hobbs time at dispatch on the accident flight from Marietta, Georgia, was 318.5. The airplane was topped off with 42.9 gallons of 100 low lead fuel on April 19, 2004. No fuel was obtained at Greenwood, South Carolina. The Hobbs meter at the crash site was destroyed by fire.

The maximum gross weight of the SR20 for takeoff is 3,000 pounds. The pilot completed a weight and balance before departing on the flight from Marietta, Georgia, to Greenwood, South Carolina. The empty weight of the airplane was 2,145 pounds. The pilot indicated he had 350 pounds in the front seats, 150 pounds in the rear seat, and 56 gallons of fuel for a total ramp weight of 2,981 pounds. The pilot and three passengers departed Marietta, Georgia, with a computed ramp weight of 3,111 pounds. The pilot and three passengers departed Greenwood, South Carolina, with a computed ramp weight of 3,045 pounds.

METEOROLOGICAL INFORMATION

The Greenwood Airport, Greenwood, South Carolina, 1428 surface weather observation was wind 240-degrees at 10 knots, gusting to 21 knots, visibility 10 miles, clear, temperature 82-degrees Fahrenheit, dew point temperature 48-degrees Fahrenheit, and altimeter 30.30.

WRECKAGE INFORMATION

The wreckage was located in a wooded area in a valley behind 213 and 215 Chatham Court, Greenwood, South Carolina. The airplane was 1,812 feet south southwest of Greenwood Airport, Greenwood, South Carolina.

Examination of the crash site revealed that the airplane, collided with two trees and the ground while descending. Forty-five degree "v" cuts were present on a tree 36 feet above the base of the tree. The airplane came to rest on a heading of 270-degrees magnetic, and was consumed by a post crash fire.

The engine mounts and engine assembly separated from the firewall and the engine assembly was displaced to the left. All four engine mounts were broken. The firewall was bent inward. The starter was crushed forward and the right magneto broke off and was not located. The number one alternator was burned and the support bracket was broken. The number two alternator was burned and separated from the engine assembly. The oil filter and a piece of the oil filter adapter were broken off. The oil cooler was crushed. The burned remnants of the upper and lower engine cowling separated from the fuselage and was located forward of the engine compartment. The nose gear separated from the engine mount assembly and was displaced aft and to the left. The propeller assembly separated from the crankshaft with the propeller flange attached to the propeller hub. The propeller spinner remained attached to the propeller hub and received impact damage. All three-propeller blades remained attached to the propeller hub and exhibited, "s" bending, torsional twisting, and chord wise scarring. One propeller blade tip was separated 28-inches outboard of the propeller hub, and the propeller tip was located wedged in a tree.

The cabin area was consumed by fire extending aft to the baggage compartment. The left and right cabin doors separated and the cabin door pins were in the extended position. The fuel selector valve was in the left wing integral fuel tank position. Four seatbelt and shoulder harness buckles were separated from their attachments points. Three of the seatbelts and shoulder harnesses were in the locked position. The male end of the remaining seatbelt and shoulder harness assembly was located, but the female end was not recovered.

The right wing was attached to the fuselage at the spar tunnel. The remnants of the right wing were displaced aft. The upper and lower wing skins were consumed by fire. The right wing flap

was consumed by fire. The flap jackscrew, which controls both flaps, revealed the flaps were in the up position. The inboard 7-inches and the outboard 21-inches of the right aileron received fire damage. The middle section of the aileron was consumed by fire. The right main landing gear and tire separated from the right wing and was damaged by fire. The fuel collector tank and integral tank were ruptured and consumed by fire.

Continuity of the aileron and roll trim system was confirmed from both control yoke assemblies to the forward pulley gang, both kick out pulleys, and both aileron actuation pulleys. Continuity of the elevator was confirmed from both control yoke assemblies to the forward pulley gang, aft pulley gang, and rudder/elevator pulley gang. Continuity of the rudder pedals was confirmed to the forward pulley gang, rudder/elevator pulley gang, and empennage pulley gang. The rudder push pull rod was attached to the rudder empennage bell crank.

The empennage separated aft of the Cirrus Airframe Parachute System (CAPS) compartment. The empennage extending aft to the horizontal stabilizer was consumed by fire. The vertical stabilizer, horizontal stabilizer, and rudder separated from the fuselage and received fire damage. The horizontal stabilizer separated. The left and right elevator separated from the horizontal stabilizer and was damaged by fire.

The CAPS compartment cover separated from the fuselage. No impact marks were present on the striker plate. The left and right front attachment harnesses were consumed by fire. The igniter assembly received fire damage. The base of the rocket cone separated from the cone adapter. The igniter was fired. The CAPS activation cable was connected to the igniter actuator. The dual parachute risers were extended to the left and aft of the fuselage. Fifteen feet of the dual risers received fire damage. The parachute suspension lines were partially extended and separated by fire in three sections. The parachute canopy was folded and portions remained inside the deployment bag. The parachute canopy received fire damage. The slider assembly was in the factory-installed position. The rocket motor pick-up collar was damaged. The rocket motor incremental bridle was stripped. The rocket motor cylinder was not located. The pyrotechnic line cutters' firing pins were intact and separated from the parachute assembly.

The left wing was attached to the fuselage at the spar tunnel. The left wing was accelerated forward. The upper and lower wing skins were consumed by fire. The left aileron separated from the left wing and received fire damage. The left flap hinges separated from the left wing. The left outboard 40-inches of the flap received fire damage and the inboard section of the flap was consumed by fire. The left flap was in the up position. The left fuel collector tank and integral fuel tank were ruptured and sustained fire damage. The left main landing gear and tire separated from the left wing and was damaged by fire.

Examination of the engine revealed the left and right engine exhaust tubes were fire damaged, crushed, and broken. The induction tubing was partially melted. The air box and air filter were fire damaged. The throttle linkage was attached to the fuel control unit lever. The lever was bent and the butterfly was in the closed position. The top of the propeller governor was broken off and the housing was heat stressed. The crankshaft flange was broken off and 1-inch of the crankshaft was visible. The engine fuel pump received fire damage. The pump was removed, the drive was turned with a drill in a solvent tank, and solvent was emitted from the outlet fitting. The fuel manifold valve was removed and disassembled, and the fuel manifold valve housing had started to melt. The diaphragm was fire damaged, the fuel manifold valve screen was dry and unobstructed. The mixture linkage was attached to the mixture lever on the fuel pump and was positioned against the idle cutoff stop. The fuel pump was removed and the coupler was intact, and the drive was hard to turn. The fuel injection lines and injectors were intact and received fire damage. All top and bottom ignition leads were burned and broken. No holes were visible on the top of the left and right engine case halves. The No.6 forward top through-bolt top-nut on the right side of the engine case half was split. The left magneto was removed. The magneto drive was turned with a power drill and spark was observed at all ignition towers.

All top sparkplug "B" nuts were melted. All bottom "B" nuts received fire damage and the No.6 "B" nut was melted. The top and bottom spark plugs were removed and all electrodes were normal when compared to the Champion Aviation Check-A-Plug Chart. The No.3 and No.5 bottom sparkplugs were oil soaked. All cylinders received fire damage. The No. 2, 4, 5, and 6 cylinder rocker box covers were damaged. A compression and suction check was performed. Suction and compression was present on all cylinders except for No.1 and No.3. Valve and drive train continuity was observed on all cylinders except for the No.3 exhaust valve. The exhaust valve was stuck in the open position. Blow-by was observed on the No.1 cylinder intake port. The exhaust pushrod housings were bent on the No.4 and No.6 cylinders. The No.1 cylinder was removed and molten aluminum was present between the intake valve face and seat. The No.3 exhaust valve and valve springs were removed. Heat was exhibited in the valve stem area. The intake valve was removed. Molten aluminum was present in the valve port area. The crankshaft was turned by rotating the secondary alternator drive gear by hand. All fuel injectors were removed and the No.3 injector was bent. Seven quarts of oil was indicated on the dipstick, and the oil filter adapter was broken. The oil sump was removed and an after market blue colored oil pan quick drain plug was found in the oil pan.

MEDICAL AND PATHOLOGICAL INFORMATION

A Forensic Pathologist from Newberry Pathology Associates, Newberry, South Carolina, conducted a postmortem examination of the private pilot on April 20, 2004. The cause of death was "blunt head 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 carbon monoxide, cyanide, and ethanol. Acetaminophen was detected in the blood and is an over-the-counter pain-reliever and fever-reducer, often known by the trade name Tylenol. Ephedrine was detected in the urine and is sold (as a component of *ephedra*; or *Ma-Huang*;) as a stimulant, weight loss product, or decongestant in many nutritional supplements and is an asthma medication. Pseudoephedrine was detected in the urine and is a common decongestant with a trade name Sudafed that is found in many over-the-counter cold and allergy preparations. Doxylamine was present in the urine and is a sedating over-the-counter antihistamine, often used in sleep aids such as Unisom. It is also commonly found in multi-symptom cold relievers such as Alka-Seltzer Plus Night-Time Cold Medicine and Vicks Nyquil Multi-Symptom Cold/Flu Relief. Dextromethorphan was detected in the blood and is an over-the-counter cough suppressant, available in a large number of preparations, including the multi-symptom cold relievers.

A Forensic Pathologist from Newberry Pathology Associates, Newberry, South Carolina, conducted a postmortem examination of the three male passengers on April 20, 2004. The cause of death was "blunt head trauma." No toxicology specimens were requested.

TEST AND RESEARCH

Review of the Pilot's Operating Handbook for the Cirrus Design SR20 states in Section 4, Normal Procedures, Before Takeoff, "7. Flaps 50 percent and check."

Review of the Pilot's Operating Handbook for the Cirrus SR20 states in Section 5, Performance Data, Figure 5-9, that at a pressure altitude of 1,000 feet with an outside temperature of 30-degrees Celsius the takeoff ground distance is 1,766 feet. The Greenwood Airport runway 27 is 5,003 feet in length.

Review of the Pilot's Operating Handbook for the Cirrus Design SR20 states in Section 5, Performance Data figure 5-7 that the airplane will stall at 65 knots with a 0-degree bank angle at 3,000 pounds with the most forward center of gravity. The airplane will stall at 64 knots with a 0-degree bank angle at 3,000 pounds with the most aft center of gravity.

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N6057M 20050120

N889JB 20050115

N1159C 20041204

N1223S 20040910

N8157J 20040419

N100BR 20031012

N9523P 20030118

N566T 20021103

ATL04WA042

On October 12, 2003, at 1105 coordinated universal time, a Cirrus Design Corporation SR-22, N100BR, registered to and operated by Aircraft Guaranty Management LLC, collided with trees and the ground in the mountains near Pomplona, Spain. A visual flight rules (VFR) plan was filed by the pilot. The pilot and three passengers were fatally injured, and the airplane was destroyed. The flight departed Ibiza Island on October 12, 2003 at 1004 coordinated universal time.

The airplane departed Ibiza Island and expected to make a 4-hour flight to Basilea-Mulhouse in Switzerland. Radar contact was lost 25 miles off the east Spanish coast. The last radio contact made from Coasta Brava was at 1055 coordinated universal time at 1,500 feet.

The accident investigation is under the jurisdiction of and is being conducted by the Coordinator of the Air Accidents Investigation Commission. Further information can be obtained from:

Carlos Cros Barberan
Investigator Coordinator of the Air Accidents Investigation Commission
Commission de investigacion
De accidentes e incidentes de aviacion civil
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N9523P 20030118

N566T 20021103

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N837CD 20020424

N893MK 20020123

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CHI03FA057

HISTORY OF FLIGHT

On January 18, 2003, at 0638 central standard time, a Cirrus SR-22, N9523P, owned and piloted by a private pilot, was destroyed following an in-flight collision with terrain near Hill City, Minnesota. The 14 CFR Part 91 personal flight was not on a flight plan. Visual meteorological conditions prevailed at the time of the accident. The pilot and single passenger sustained fatal injuries. The airplane departed the Grand Rapids/Itasca County Airport (GPZ), Grand Rapids, Minnesota, at 0630, with an intended destination of St. Cloud Regional Airport (STC), St. Cloud, Minnesota.

An individual representing N9523P contacted the Princeton Automated Flight Service Station (AFSS) at 0455 on the morning of the accident. The individual requested a visual flight rules (VFR) weather briefing from GPZ to STC, departing at 0600. The caller was advised of the current and forecast conditions along the proposed route of flight, as well as of the Aeronautical Meteorological Information (AIRMET) in effect at the time.

An individual representing N9523P requested an abbreviated weather briefing from Princeton AFSS at 0541. Proposed departure time was stated as 0600. During his initial statement to the briefer, the caller noted that conditions at GPZ were marginal at the time. He noted that current conditions at GPZ were about 2,800 feet overcast and that he was "hoping to slide underneath it and then climb out." He requested current conditions at STC and any pilot reports. He was advised of the STC conditions and that no pilot reports were on file across the state at that time.

Several witnesses reported seeing and/or hearing the aircraft shortly before the accident. An individual who resided approximately 4-1/2 miles south of Grand Rapids reported seeing an aircraft flying southbound past his residence. He stated the aircraft appeared to be following the road. He estimated the aircraft's altitude as 100 feet above the trees, and its speed as 150 miles per hour. He noted the engine sound was smooth, it "wasn't laboring." He added: "That thing was moving." He recalled the weather conditions at his location as clear and moon lit.

A second individual who resided at the north end of Hill Lake stated that he stepped outside and saw an airplane come over a hill northeast of his home. The aircraft's flight path appeared to be northeast-to-southwest, passing slightly east of his location. He remarked that he thought the aircraft was "too low" and the pilot "better pull that thing up." He recalled weather conditions at his location as partly to mostly cloudy, with a fair amount of moonlight.

A third individual, located in Hill City at the time, reported seeing an aircraft similar to the accident aircraft fly over. He stated the airplane "seemed to be following the highway." He added, "If he'd been two blocks east, he'd have hit the water tower," estimating the aircraft's altitude as 100 feet agl. He noted the engine seemed to be at full throttle and that it "wasn't missing." "He was going fast," he added. He recalled weather conditions at his location as clear and cold.

A fourth individual, located about 1/2 mile south of the accident site, heard the aircraft fly over. He stated that it "sounded like the prop wasn't catching any air. It was just screaming." Approximately 3-4 seconds after the aircraft flew over, he stated that he heard what he considered to be the impact. He noted that as he was looking out his window, he saw a

"fireball" up over the trees. He recalled the weather conditions at his location as clear, with a full moon.

Initial 9-1-1 calls were received by local authorities approximately 0640. The accident site was located at 0738 with the assistance of an emergency medical helicopter affiliated with a local hospital.

PERSONNEL INFORMATION

The pilot, age 47, held a private pilot certificate with an airplane single-engine land rating. He held a third class medical certificate issued on October 28, 2002, with a limitation of "Must wear corrective lenses."

The pilot's logbook was recovered at the scene. Some pages were damaged and partially unreadable. According to the logbook, he had logged 248.0 hours total time. Of these, 18.9 were in an SR-22. Except for 1.0 hour in a simulator, the remaining flights logged were in a Cessna 172 aircraft.

He had logged a total of 57.0 hours of instrument flight time and 19.0 hours of night flight time. Instrument and night flight time in the SR-22 totaled 0.3 and 2.3 hours, respectively.

According to Cirrus Design/University of North Dakota records, the pilot completed the SR-22 training course on December 12, 2002. The course consisted of 4 flights for a total of 12.5 hours of dual flight instruction and 5.3 hours of ground instruction.

The record indicates a ground lesson, which included "Brief on VFR into IMC procedures", was completed on the last day of the course. The flight lesson entitled "IFR Flight (Non-rated)" was not conducted.

A VFR-only completion certificate and High Performance aircraft endorsement were awarded on December 12th. The endorsement was limited to SR-22 aircraft only, according to the training record.

AIRCRAFT INFORMATION

The airplane involved in the accident was a 2002 Cirrus SR-22, S/N 0399. An airworthiness certificate was issued on November 26, 2002. The pilot took delivery of the aircraft on December 9, 2002. Total time on the airframe and engine at the time of the accident was 35.7 hours.

Maintenance logbook entries noted minor discrepancies were repaired after delivery. On December 5, 2002, an entry indicating removal, rebalancing and reinstallation of the left elevator was completed. According to Cirrus Design records, the item was related to the elevator tip being replaced due to some cosmetic defects noted on delivery. Cirrus Design procedures require rebalancing of the flight controls after repair or repainting.

Logbook entries also indicate an engine pre-heater was installed after delivery. This was completed on December 27, 2002, at 30.2 hours.

METEOROLOGICAL INFORMATION

Routine aviation weather reports (METAR's) for airports in the area on the morning of the accident were as follows:

Location: Grand Rapids (GPZ) -- 20 nautical miles north of the accident site;
Time: 0635;

Wind: 320 degrees magnetic at 17 knots, gusting to 22 knots;
Visibility: 7 statute miles;
Sky condition: Few clouds at 300 feet agl, broken clouds at 1,400 feet agl, and overcast clouds at 2,700 feet agl;
Temperature: -16 degrees Celsius;
Dew point: -21 degrees Celsius;
Altimeter: 29.85 inches of mercury.

Location: Aitkin Municipal (AIT) -- 21 nautical miles south of the accident site;
Time: 0635;
Wind: 310 degrees magnetic at 9 knots, gusting to 17 knots;
Visibility: 10 statute miles;
Sky condition: Scattered clouds at 2,500 feet agl;
Temperature: -14 degrees Celsius;
Dew point: -17 degrees Celsius;
Altimeter: 29.88 inches of mercury.

Location: Brainerd Lakes Regional (BRD) -- 37 nautical miles south-southwest of the accident site;
Time: 0636;
Wind: 310 degrees magnetic at 10 knots, gusting to 16 knots;
Visibility: 10 statute miles;
Sky condition: Broken clouds at 2,300 feet agl;
Temperature: -16 degrees Celsius;
Dew point: -19 degrees Celsius;
Altimeter: 29.91 inches of mercury.

AIRMETs for IFR conditions and turbulence were in effect at the time of the accident. AIRMET Sierra for occasional ceilings below 1,000 feet agl and/or visibilities below 3 statute miles in light snow showers and blowing snow was issued at 0245. IFR conditions along the GPZ-STC route of flight were expected to continue beyond 0900, ending around 1200.

AIRMET Tango for occasional moderate turbulence below 8,000 feet msl was issued at 0245, and was forecast to exist through 1500.

According to data obtained from the National Climactic Data Center, the winds aloft in the vicinity of Minneapolis (the closest reporting station to the accident site) at 0600 on January 18th were from 325 degrees magnetic at 31 knots, at an altitude of 914 meters (2,999 feet).

According to data published by the U.S. Naval Observatory, civil twilight in Grand Rapids, Minnesota, on the morning of the accident began at 0720. Sunrise was at 0754. A full moon occurred at 0448 that morning.

The Aeronautical Information Manual defines marginal VFR weather conditions as a ceiling of 1,000 to 3,000 feet and/or a visibility of 3 to 5 miles.

WRECKAGE AND IMPACT INFORMATION

The NTSB on-site investigation began on January 19, 2003, approximately 0900.

The location of the accident site was determined to be 46 degrees 53 minutes 28 seconds North latitude and 93 degrees 35 minutes 48 seconds West longitude by a global positioning

system receiver.

The aircraft impacted into level wooded terrain. The site was located approximately 3/4 mile east of Minnesota Highway 169 and 1/4 mile south of 610th Street in Aitkin County. The surrounding area was sparsely populated and heavily wooded.

The entire debris path was approximately 500 feet long. It was oriented on a 280-degree magnetic heading.

Beginning at the initial tree strikes, the debris pattern observed was fan shaped. It measured a maximum width of approximately 40 feet over a distance of about 320 feet. The area continued to a distance of approximately 370 feet from the initial impact strikes and included the cabin area of the aircraft. The engine, with the hub and propeller attached, was found approximately 500 feet from the initial impact strikes, completely separated from the aircraft structure.

The angle formed by the tree strikes, from initial tree contact to terrain impact, was approximately 15 degrees (relative to the terrain).

The aircraft was fragmented. Wing and empennage structure was spread throughout the "fan shaped" area. The left and right wing tips were found 85 feet from the initial tree contact. The left tip was 22 feet left of the debris path centerline. The right tip was 8 feet right of the debris path centerline.

The rudder and vertical stabilizer spar, with hinges attached, was located along the debris path centerline. Vertical stabilizer skin surfaces were located near the rudder. The horizontal stabilizer was separated from the aircraft and was also found along the debris path centerline. The elevators were separated from the horizontal stabilizer.

The ailerons were separated from the wings. Although they were found in multiple pieces, each aileron was accounted for in its entirety at the accident site.

Hinges were separated from their respective control surfaces and mating spars. A section of spar remained attached to the hinge fittings, however, the spars themselves were fragmented. The hinges, although damaged, were still intact. Attachment hardware was secure. No pre-existing defects in the spars were observed.

The flap actuator was recovered. The jackscrew portion of the actuator was broken approximately 11.75 inches from the housing. According to Cirrus Design, the actuator extension observed corresponded to a flaps up (zero degree deflection) configuration.

The cabin area was damaged. It was located along the debris centerline, approximately 330 feet from the initial tree strikes. It was contained within a 10-foot diameter area.

The engine was found sitting inverted, separated from the engine mount and cowling, and was located approximately 150 feet from the main cabin area. The propeller was still secured to the engine. The three-blade Hartzell propeller exhibited S-shaped bending and multiple leading edge gouges. Two of the blade tips were sheared from the remainder of the propeller. One blade was bent through approximately 100 degrees, beginning about 9 inches from the hub.

An engine examination was conducted. Engine continuity was verified through crankshaft rotation. Compression was present on all cylinders. Cylinder five exhibited less compression than the others.

The magnetos were damaged and produced a spark when the drive shaft was rotated. The spark plugs were removed. They were light gray in appearance and appeared to be gapped correctly.

The fuel manifold was removed and disassembled. The diaphragm was intact and fluid

consistent in appearance and odor to aviation gasoline was present. A small amount of debris, including a partial pine needle, was present.

The fuel pump was separated from the engine and the drive coupling was missing. No fuel was present in the pump. The pump vanes were intact. The oil pump was free to rotate by hand.

The exhaust muffler was disassembled. The muffler was partially crushed, however it was not perforated.

The artificial horizon was disassembled. The gyro assembly was intact. Score marks were found on the gyro case.

Portions of the cabin area and several wing skin fragments, as well as localized ground cover and trees within the debris area, exhibited evidence of a post-impact fire.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the Ramsey County Medical Examiner's Office, St. Paul, Minnesota, on January 19, 2003.

A Forensic Toxicology Fatal Accident Report concerning the pilot was prepared by the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma. The following findings were reported:

EPHEDRINE present in the Kidney and Liver;
PHENYLPROPANOLAMINE detected in the Kidney and Liver;
PSEUDOEPHEDRINE detected in the Kidney and Liver.

According to the report, no blood was available for testing.

Ephedrine is the active ingredient found in over-the-counter decongestants, allergy medications, asthma medications, and diet pills.

Pseudoephedrine is the active ingredient found in common over-the-counter decongestants, such as Sudafed.

Phenylpropanolamine is a metabolite of Ephedrine and Pseudoephedrine. It is an over-the-counter decongestant and appetite suppressant. Phenylpropanolamine is currently not commercially available in the United States.

RESEARCH AND TESTING

Radar data was obtained from the Federal Aviation Administration (FAA) - Minneapolis Air Route Traffic Control Center (ARTCC). Review of the data indicated a single "1200" VFR transponder beacon code in the vicinity of GPZ about the time of the accident. The target's ground track was plotted using a commercially available computer program and is appended to this report.

The initial radar contact was at 0630:16 over GPZ at 1,700 feet pressure altitude. The aircraft associated with the beacon code proceeded southbound, paralleling Minnesota Highway 169, and reached a maximum of 3,200 feet pressure altitude.

At 0636:51, the target began a descending left turn, reaching a pressure altitude of 2,400 feet at 0637:27. This was an average descent rate of 1,166 feet-per-minute (fpm). From this location, the target entered a climb while the radius of the continuing left turn decreased.

Final radar contact was at 0637:39; 2,900 feet pressure altitude. This was an average climb rate of 2,500 fpm from a pressure altitude of 2,400 feet at 0637:27. The coordinates of this contact were 46 degrees 53 minutes 26 seconds North latitude and 93 degrees 35 minutes 30

seconds West longitude.

Final radar contact was 0.21 nautical miles from the accident site, as calculated by the plotting program. The magnetic course from the last radar location to the site was 278 degrees.

The aircraft's average ground speed, true airspeed and climb/descent rate were computed based on the raw radar data and measured winds aloft. The aircraft's true airspeed averaged 191 knots over the final one minute of radar data. The rate of climb averaged 2,500 fpm between the final two radar data points. This followed an average descent rate of 2,000 fpm, 36 seconds earlier, between 0636:51 and 0637:03. Plots of the aircraft's ground speed, true airspeed and climb/descent rates are appended to this report.

The SR-22 Pilot's Operating Handbook (POH) denotes airspeed limitations and performance capabilities for the aircraft. The handbook specifies a "Never Exceed Speed", VNE, of 204 knots calibrated airspeed. The "Maximum Structural Cruising Speed", VNO, is denoted as 180 knots calibrated airspeed. It also lists a rate of climb of 1,428 fpm at a sea level (zero foot) pressure altitude and -20 degrees Celsius air temperature.

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N1159C 20041204

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HISTORY OF FLIGHT

On November 3, 2002, approximately 1225 mountain standard time (MST), a Cirrus Design Corporation. SR20, single-engine airplane, N566T, was destroyed after impacting terrain while maneuvering near Las Vegas, New Mexico. The non-instrument rated private pilot, sole occupant of the airplane, sustained fatal injuries. The airplane was registered to the pilot and another private individual and was operated by the pilot. Instrument meteorological conditions prevailed, and a flight plan was not filed for the 14 Code of Federal Regulations Part 91 personal flight. The cross-country flight departed Renner Field (GLD), in Goodland, Kansas, approximately 1015 central standard time, and was destined for Double Eagle II Airport (AEG), in Albuquerque, New Mexico.

During a telephone interview with a relative of the pilot, the relative stated the pilot would typically depart from his private airstrip, which was located at the pilot's residence, at sunrise. On the night prior to the accident, the pilot and relative checked the weather on the computer using Direct User Access Terminal (DUATS), and the pilot also contacted flight service for any temporary flight restrictions along the planned route of flight. The pilot's planned route of flight was the following: depart North Dakota, fuel stop in Pierre, South Dakota, fuel stop in Goodland, Kansas, and then to AEG (the accident flight was the second time the pilot had flown the planned route). On the morning of the accident, at 1115 MST, the pilot contacted the relative and reported he was 136 miles from AEG and the weather was beautiful. The relative stated the pilot would typically fly the airplane at a cruise speed of 150 knots and at an altitude of 1,000 feet agl.

A fixed base operator (FBO) refueler, located at Renner Field, stated the accident airplane landed approximately 1050. The refueler topped off both fuel tanks and talked with the pilot about the airplane. The pilot departed at 1115. According to the refueler, the FBO was equipped with a computer weather reporting station, and prior to departing, the pilot had not checked the weather on the computer.

An employee of the U.S. Fish and Wildlife Service, Las Vegas National Wildlife Refuge, Las Vegas, New Mexico, reported the 9,000 acre wildlife refuge was open to the public on Sundays in November. The public was able to tour the refuge on a 4.5-mile one-way auto tour loop road to view the migratory bird activity. On the morning of the accident, between 0820 and 0840, the weather was clear; however, a front was coming in from the east. From 0900 until 1045, the employee logged four vehicle tours with a total of 11 individuals entering the refuge. The employee and a refuge volunteer discussed that the weather was not good for bird viewing and thought the front would possibly blow over. Between 1100 and 1115, the volunteer drove on the loop road, and at this time, the "fog was heavy." Approximately 1330, the employee closed the front entrance gate and made a final drive through the loop road. At that time, the employee reported the "fog was very heavy and visibility was very poor, probably no more than 30 [meters], and [the employee] remembered driving through pockets of heavier fog." While driving west on the loop road near the exit, the employee discovered a portion of the airplane wreckage on the side of the road.

The refuge volunteer reported the weather was partly to mostly cloudy most of the morning. By 1100, [the sky] had become overcast, and fog was forming over the refuge lakes and ponds. By 1130, the refuge volunteer stated the visibility was poor. The volunteer took his final ride on

N901CD 20020528

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N116CD 20010410

the loop road and reported the fog had thickened and visibility had become too poor for waterbird observation and identification.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with an airplane single-engine land rating. The private pilot was issued a third class medical certificate on November 13, 2000, with the limitation, "holder must wear corrective lenses for distant vision and possess for near vision while exercising the privileges of his airman certificate." The pilot's most recent biennial flight review was completed on January 8, 2001. According to the logbook, the pilot was originally issued his private pilot certificate in 1950.

A review of the private pilot's logbook revealed the private pilot had accumulated approximately 1884 hours total flight time, of which 82 hours were in the accident airplane. The date of the last recorded entry in the logbook was May 18, 2002, which was a flight recorded as "Albuquerque - Home, stops at KS and Pierre SD." On January 8, 2001, the pilot completed the New-Owner Training for the Cirrus SR20 (a program sponsored by Cirrus Design Corp.). The course instruction is provided by contract flight instructors.

AIRCRAFT INFORMATION

The 2000-model Cirrus Design Corp. SR-20 airplane, serial number 1109, was a low-wing, fixed tri-cycle landing gear, primarily composite, and monocoque design airplane. The airplane was powered by a six cylinder, horizontally opposed, air-cooled, fuel injected Teledyne Continental Motors (TCM) IO-360-ES-6 engine (serial number 357283), rated at 200 horsepower. The airplane was equipped with a three-blade Hartzell constant speed, aluminum alloy propeller. The airplane was configured to carry four occupants.

The airplane was issued a standard airworthiness certificate on December 29, 2000, and was certificated for normal category operations. The airplane was registered to the owner on February 22, 2001. At the time of the accident, the airplane and engine had accumulated a total time of 276.8 hours.

According to the FAA approved Cirrus Design SR20 Pilot's Operating Handbook (POH), the airplane uses conventional flight controls for the ailerons, elevator and rudder. The control surfaces are pilot controlled through either of the two single-handed side control yokes. The flight control system contains a combination of push rods, cables, and bell cranks for the control of the surfaces.

METEOROLOGICAL INFORMATION

At 1153, the LVS Automated Surface Observation System (ASOS) station, located 8.1 miles north of the accident site, reported the wind from 070 degrees at 11 knots, visibility 10 statute miles, ceiling overcast at 300 feet agl, temperature 32 degrees Fahrenheit, dew point 29 degrees Fahrenheit, and an altimeter setting of 30.19 inches of Mercury.

At 1253, the LVS ASOS station reported the wind from 090 degrees at 11 knots, visibility 10 statute miles, ceiling overcast at 500 feet agl, temperature 34 degrees Fahrenheit, dew point 29 degrees Fahrenheit, and an altimeter setting of 30.19 inches of Mercury.

At 1239, a pilot report (PIREP) was submitted by a Piper PA-28 aircraft on a flight from Dalhart (DHT), Texas, to Sante Fe (SAF), New Mexico, operating an altitude of 10,500 feet. The location of the aircraft at the time of the submission was unknown. The PIREP reported the sky was overcast with the layer tops at 10,000 feet msl, the overcast layer began 20 nautical miles west of DHT to 25 nautical miles southeast of SAF, and no turbulence.

The National Weather Service, in Kansas City, Missouri, issued AIRMET Sierra Update 3, on November 3, 2002, at 1020, which was valid until 1400, on November 3, 2002. The AIRMET

stated the following, "occasional ceiling below 1,000 feet, visibility below 3 miles in mist, fog. Conditions ending [1200 to 1300]. Mountains occasionally obscured clouds, mist, fog. Conditions ending [1300 to 1400]." There were no SIGMETs or Convective SIGMETs in effect for the time and area of the accident.

- A written statement was provided by a pilot who was operating a Cirrus SR22 airplane over LVS at 1500, at an altitude of 9,500 feet msl. According to the pilot, as he approached LVS from the southwest, he began to see what appeared to be a fairly thin layer of clouds. In order to maintain clearance over the top of the cloud layer, the pilot initiated a climb. At one point during the climb, the airplane entered a cloud and rime ice accumulated on the windscreen, landing gear struts, and [wing] leading edges. He stated he was in the cloud for approximately 10 seconds, and the accumulation of ice was "quite fast."

According to an FAA inspector, who responded to the accident site, the pilot did not receive a formal weather briefing from an FAA flight service station on the day of the accident.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted a field in the Las Vegas National Wildlife Refuge approximately 8.1 miles south of the Las Vegas Municipal Airport (LVS). The global positioning system (GPS) coordinates recorded at the accident site were north latitude 35 degrees 31.44 minutes and west longitude 105 degrees 10.02 minutes at an elevation of 6,540 feet. The wreckage distribution path measured approximately 1,200 feet in length on a measured magnetic heading of 280 degrees. The initial ground scar markings were consistent with the right wing tip and the three landing gears. White paint transfer was found on the dirt in the ground scar. A portion of the left wing skin came to rest on the left side of the debris field approximately 150 feet from the initial ground scar. The main wreckage, which consisted of the fuselage, portions of empennage, and the main wing spar, came to rest twisted in a barbed wire fence and on a gravel road approximately 900 feet from the ground scar. Various components and composite structure were fragmented and scattered in the debris field. The engine came to rest approximately 1,100 feet from the initial ground scar. The battery and several engine accessories came to rest approximately 1,200 feet from the ground scar. The three-bladed propeller assembly, which was separated from the engine, was located to the right (north) of the debris field in a grassy field adjacent to the gravel road.

The right and left wing skins were fragmented and located in the debris field. The main wing spar, located with the main wreckage, was fractured in two places; outboard of the spherical bearing attach point, and approximately five feet from the wing tip. The aft wing spar was fractured and fragmented in several places. Both fuel cells, located in the right and left wings, were fragmented and destroyed. The right and left ailerons and flaps were separated from their respective attach points and located in the debris field. According to the manufacturer, based on the position of the flap switch shaft, the flaps were in the retracted position. The main landing gear were separated from their respective attach points and located in the debris field. Flight control continuity was not established to the flight control surfaces.

The right horizontal stabilizer was intact. The right elevator remained attached to the torque tube and was bent downward at the center hinge attach point. The left horizontal stabilizer's skin was debonded from the forward and aft spar. The left forward spar was fractured, and the aft spar was disbonded. The vertical stabilizer was intact and displayed gouges and scratches, and the rudder was separated and located in the debris field.

The left and right composite fuselage halves were debonded at the centerline. The top of the fuselage, above the pilots seats, was fragmented and located in the debris field. The fuselage floor was fragmented, and the cabin rollover structure was separated from the fuselage halves. The right and left doors were intact, but separated from the fuselage. The door pins were found engaged, and the door handles were in the latched position. The left and right forward seats were separated from the fuselage floor. The left bottom seat core was crushed on the left front

corner, and the right bottom seat core displayed minor crush damage relative to the left core. The instrument panel was fragmented and five instruments were separated from their mounting structure. The attitude indicator, the directional gyro, and the vertical speed indicator were destroyed. The vacuum gauge was destroyed. The altimeter displayed an altitude of 7,600 feet and the Kollsman Window was set at 30.20 inches of Mercury. The throttle and mixture controls were found in the full forward position. The left control yoke was separated, and the right control yoke was found intact.

The Cirrus Airframe Parachute System (CAPS) parachute package was found adjacent to the main wreckage. The parachute package was intact, and the parachute was stowed. The CAPS rocket was found separated from the igniter base and had not been fired.

The engine, which was separated from the airframe, tumbled along the ground prior to coming to rest in a grass field. All of the engine accessories were separated from the engine and were located in the debris field. The number five cylinder was damaged, and the cylinder head was partially separated from the crankcase. Puncture holes were found in the oil sump. The oil filter was separated and crushed. The oil filter was clear of debris and metal contamination. The crankshaft was separated near the crankcase halves, and the fracture displayed 45-degree shear lips. The crankshaft was rotated manually through the accessory drive gears, and continuity was established to the cylinders, valve train, and the accessory gears. Both magnetos were rotated by hand, and spark was noted on all terminals. The spark plugs were removed, and according to the engine manufacturer representative, the spark plug electrodes displayed moderate wear and light deposits. The vacuum pump drive was separated and the pump housing displayed damage. The vacuum pump cover was removed, and the vanes were intact, and the pump rotor was fractured. The exhaust and intake system was separated and crushed.

The three-bladed propeller hub remained intact and attached to the fractured crankshaft flange. The propeller hub dome was fractured and the pitch change tube was bent. One blade was curled aft, displayed leading edge gouging, and chordwise scratching was noted near the blade tip. One blade was bent approximately 45 degrees in the direction of rotation and was twisted toward the non-cambered side near the blade shank. One blade was twisted toward the direction of rotation and twisted toward the cambered side near the blade tip.

PATHOLOGICAL INFORMATION

An autopsy was performed by the University of New Mexico, Office of the Medical Investigator, Albuquerque, New Mexico, on November 4, 2002, and specimens were retained for toxicological analysis by the FAA's Civil Aeromedical Institute's (CAMI) Forensic and Accident Research Center, Oklahoma City, Oklahoma. According to the Chief Medical Investigator, the cause of death for the pilot was multiple blunt force injuries due to a high speed aircraft crash.

According to CAMI, the pilot's toxicological tests were negative for alcohol, and an unspecified amount of Diphenhydramine was detected in the kidney and liver. The FAA Regional Flight Surgeon stated, "Diphenhydramine is an antihistamine used in the treatment of allergic symptoms. It can cause significant drowsiness and is not recommended for use while performing safety-sensitive activities."

TEST AND RESEARCH

On March 3, 2003, a Garmin GNS 430 GPS, which was installed in the airplane, was examined by the manufacturer for data extraction. According to Garmin, no data was available from the unit; "all Garmin-panel mounted avionics do not store data once power is disconnected from the unit." In addition, the unit sustained damaged during the accident.

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N286CD 20050206

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N1159C 20041204

N1223S 20040910

N8157J 20040419

N100BR 20031012

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N566T 20021103

FTW02FA162

HISTORY OF FLIGHT

On May 28, 2002, approximately 1630 mountain daylight time, a Cirrus Design Corporation SR-20 single-engine airplane, N901CD, registered to and operated by N901CD Flying Club of Duluth, Minnesota, was destroyed upon impact with mountainous terrain while climbing near Angel Fire, New Mexico. The commercial pilot, who was the sole occupant, was fatally injured. Visual meteorological conditions prevailed and a flight plan was not filed for the 14 Code of Federal Regulations Part 91 personal flight. The cross-country flight departed from the Angel Fire Airport (AXX), near Angel Fire, New Mexico, at 1627, and was destined for Sioux Falls, South Dakota.

Prior to departing Runway 35, the pilot made a radio call requesting the temperature. An employee of the Pierce Air, Inc., fixed base operator (FBO) answered the pilot's request with the current weather conditions. The employee observed the airplane takeoff without incident.

A witness, located northeast of AXX, reported to have observed the airplane fly overhead "really low at a relatively slow airspeed." The witness stated that he observed the airplane fly overhead as it was "trying to climb the mountain." As the airplane was flying parallel, "the [air] plane seemed to sound like any other [air]plane would, but as it got closer to the mountain and trees, it tried to elevate higher than where it was when it flew overhead. At that point, the [air] plane got lower with every second, then started to sputter as it was trying to elevate higher." As the witness observed the airplane, he further stated "it seemed the airplane was not gaining any elevation and was flying about the same height as it was when it passed overhead." The witness heard an explosion followed by a billowing cloud of smoke.

Another witness observed the airplane during run-up in preparation of a takeoff from the south end of the runway. The witness proceeded north on highway 434 to highway 64 then northeast. The witness observed the airplane "fly over so low, it got my attention." The witness observed the airplane as he traveled north and then east on Country Road B-36. The witness stated the "[air]plane seemed to be having trouble gaining altitude." The witness was a short distance from his home when he observed the airplane fly over very low past a ridge approximately one-quarter mile east, and within seconds saw black billowing smoke.

A third witness located northeast of AXX was indoors and heard the airplane fly overhead. He thought the airplane sounded "funny." The witness stepped outside and observed the airplane fly overhead and it "seemed to be missing or running erratically, maybe like sputtering while on a southerly heading." The witness went back inside and thought "the plane needed a tune-up or something."

A demonstration pilot for the manufacturer, who had flown the accident aircraft on several occasions, stated that he departed from Denver on a hot day with full fuel and ski equipment in the back, earlier that year. According to the pilot, the aircraft performed "as advertised." On departure from Denver, he was asked if he could expedite the climb through 8,000 or 9,000 feet for traffic. The pilot responded "negative" as he was climbing at about 300 feet per minute with the temperature gauge starting to peak.

PERSONNEL INFORMATION

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The pilot was issued a commercial pilot certificate on July 30, 1971. On September 26, 2000, the pilot was issued a second-class medical certificate with a restriction to wear corrective lenses while operating an aircraft. The Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1/2) indicated the pilot had accumulated 1,350 hours total time, of which 100 hours were in the same make and model of the accident aircraft. The pilot completed his most recent biennial flight review on June 1, 2001, in a Cirrus SR-20.

AIRCRAFT INFORMATION

The 2001-model Cirrus SR-20, serial number 1135, was a single-engine, four place airplane equipped with a Teledyne Continental Motors IO-360-ES engine, serial number 357304, that was rated at 200 horsepower. The airplane was equipped with a constant speed Hartzell three bladed propeller. The maximum gross weight of the aircraft was 3,000 lbs. The aircraft's total fuel capacity was 60.5 gallons, with 56 gallons usable fuel. The last annual inspection was accomplished on March 3, 2002, at a total airframe and engine time of 360 hours. The aircraft maintenance records were reported by the owners of the aircraft to be located in the aircraft and were destroyed by the post-impact fire. A fuel receipt was obtained at the FBO that revealed the airplane was refueled that afternoon with 37 gallons of fuel.

METEOROLOGICAL INFORMATION

At 1153, the weather facility at Las Vegas, New Mexico, located 47 nautical miles southeast of AXX reported the winds calm, visibility 10 statute miles, scattered clouds at 1,100 feet, temperature 13 degrees Celsius, dew point 1 degree Celsius, and an altimeter setting of 30.19 inches of Mercury. The NTSB Investigator-In-Charge (IIC) calculated the density altitude (DA) to be 11,807 feet MSL.

An employee of the FBO reported the current weather conditions to the pilot at the time of departure to be winds from 110 degrees at 10 knots, temperature of approximately 60 degrees Fahrenheit, and an altimeter 30.28 inches of Mercury. The witness informed the pilot that the temperature reading was "from an instrument under a carport and therefore was in the shade." A witness provided a map of the aircraft's approximate flight path, and estimated it to be 7.1 nautical miles from takeoff to the place of impact.

WRECKAGE AND IMPACT INFORMATION

The accident site was located approximately 4.3 miles east of the departure end of Runway 35. The aircraft wreckage was located on the side of a mountain in a heavily forested area. The Global Positioning System (GPS) coordinates recorded at the accident site using a hand-held GPS unit were 36 degrees, 25.686 minutes North, and 105 degrees, 12.667 minutes West. The wreckage energy path measured approximately 70 feet in length on a magnetic heading of 076 degrees, coming to rest upright at an elevation of approximately 9,733 feet.

The aircraft was right side up, and was badly burned. The burn area was about 100 feet in diameter above and below the slope. The start of the debris path was marked by freshly broken tree branches approximately 70 feet above the ground. Within the debris path, all the major structural components and flight control surfaces for the airplane were identified. Flight control continuity was established.

The left flap was found aft and to the right of the aircraft; a portion of the left aft wing spar was found aft of the left flap. The right wing tip and a portion of the right wing skin was attached, and both were found in a tree branch aft of the aircraft. The left wing tip was found on the ground aft, left and down the slope from the fuselage. Both ailerons were found aft and down the slope from the fuselage. The complete nose gear, strut, fork, wheel and tire were found to the right and aft area of the fuselage; the right portion of the fuselage fork had broken off and was missing. The aft section of the nose gear wheel fairing was found burned just to the left and down slope from the aft fuselage. The 2" plastic plug used for accessing the air valve on

the nose tire was found to the left and aft of the fuselage, down slope from the wreckage. The forward portion of the wheel fairing was not located.

The flap torque rod and flap actuator were located in the ashes. The pancake flap motor was separated from the rest of the flap assembly. The flap actuator proximity switches, wiring and aluminum cover were melted, and the aluminum gear case had also melted away leaving the steel ball screw and the steel tube that rides on the ball screw. A measurement was made from the flats of the steel tube to the top of the worm gear (=11") to determine how far the steel tube had been extended. This would indicate the position the flaps were in at the time of impact. The manufacturer disassembled an exemplar flap actuator and the components were measured. The measurement from the top of the ball screw tube was made to compare with the components found at the accident site. A flap actuator mounted in an SR-20 was actuated to duplicate the measurements made on the exemplar tube and bearing. It was determined that the flaps had been fully retracted at the time of the accident.

The left elevator had burned, and was located to the left of the aft fuselage, with the tip jutting upward toward the centerline of the fuselage. The right elevator tip was found on the ground; the main portion of the elevator was not found. The top and lower caps of the rudder were found to the aft of the fuselage, the rudder itself was not found.

The cockpit was completely destroyed by the fire; the ARNAV screen glass and frame remained and was the only instrument or radio, which could be recognized. One of the seat cores was found, with the full core depth visible on the side that was discernable. The two steel crew seat back frames were found in the cockpit area.

Both control yokes and the steel control linkages were located in the ashes of the cockpit. The control yoke carriages were not found. The center pulley gang was found; the pulleys were burned away. The steel rudder pedal tubes were recovered intact, with the two control cables still attached; the pedals were not found. On the outboard end of the left rudder tube, melted aluminum was visible flowing out of the end of the tube; this may have been all that was left of the tube insert and bracket for the left rudder tube.

The fuel selector was selected on left fuel tank; everything else that had been attached to the throttle quadrant was destroyed.

The engine exhibited severe impact and fire damage. The engine was separated from all of its mounts. The engine control cables were intact, but no longer connected to the engine. The controls at the engine were: engine at idle and mixture at idle cut off. The right and left magnetos were found and exhibited fire damage. The ignition harness was mostly consumed by the post-impact fire. The starter motor was separated from the starter adapter mounting pad. The fuel pump exhibited exterior fire damage. The vacuum pump exhibited fire damage and was still attached to the starter adapter drive pad. The oil filter canister was torn open, and the belt driven alternator was torn off its mounting bracket. The engine was shipped to Teledyne Continental Motors (TCM) in Mobile, Alabama for further inspection.

The propeller flange was broken off in the front of the crankshaft and was located to the left of the fuselage next to the cabin area. Blade one exhibited twisting toward the direction of rotation, blade two exhibited very slight twisting toward the direction of rotation, and blade three exhibited a slight bend at the tip of the blade. The spinner exhibited signs of melting.

No mechanical or structural anomalies were discovered at the accident site that could have contributed to the accident.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the Office of the Medical Investigator, State of New Mexico, of Albuquerque, New Mexico. No evidence of any preexisting disease that would have

contributed to the accident was found.

Toxicological testing was performed by the FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma. The toxicology test was positive for Carbon Monoxide that was detected in the blood sample with a measurement of 12%. Cyanide was also detected in the blood at a level of 0.98 (ug/ml). No drugs or ethanol were detected.

TESTS AND RESEARCH

The engine was examined on June 6, 2002 at Teledyne Continental Motors facility in Mobile, Alabama under supervision of an NTSB investigator. The engine exhibited severe impact and fire damage. No anomalies were found that "would suggest any engine problem prior to the accident."

Using the reported weather from AXX, the IIC calculated the density altitude (DA) to be 10,136 feet MSL at AXX at the time of departure. The DA at the accident site was calculated to be 11,807 feet MSL.

The manufacturer, Cirrus Design, calculated the following performance figures:

Takeoff Climb Gradient: 262 feet per nautical mile

Takeoff Rate of Climb: 406 feet per minute

Best Angle of Climb Airspeed (Vx): 80 kias = 93 ktas = 1.55 nautical miles per minute

Best Rate of Climb (Vy): 88 kias

With this data, the manufacturer calculated that if the airplane maintained a constant airspeed of 80 kias (Vx) after departure, it would have taken 4 minutes, 11 seconds to climb 1,700 feet. Further calculations revealed that at Vx, the airplane's approximate flight path would be 6.49 nautical miles.

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NYC02FA089

HISTORY OF FLIGHT

On April 24, 2002, at 1906 eastern daylight time, a Cirrus SR-22, N837CD, was destroyed when it impacted terrain in Parish, New York. The two certificated private pilots were fatally injured. Visual meteorological conditions prevailed at the time of the accident. No flight plan was on file for the flight, which originated at Syracuse Hancock International Airport (SYR), Syracuse, New York, and was destined for Greater Rochester International Airport (ROC), Rochester, New York. The personal flight was conducted under 14 CFR Part 91.

The two pilots were co-owners of the airplane, which, according to the manufacturer's records, was delivered on April 18, 2002. A brother of one of the pilots reported that they had intended on flying to Rochester to show the airplane to a friend.

During an initial radio call to Syracuse Clearance Delivery, at 1821, one of the pilots stated that they would depart VFR for Oswego County Airport (FZY), Fulton, New York, at 5,500 feet. The crew was given an altitude restriction of 2,000 feet within 5 miles of Syracuse International, the departure frequency, and a transponder code of 4626.

At 1822, one of the pilots contacted Syracuse Ground Control. He requested, and was cleared for, taxi to runway 10.

At 1829, one of the pilots contacted Syracuse Local Control (tower), and requested takeoff clearance. He was then cleared for takeoff.

At 1830, the crew was advised to turn left, to a heading of 360, and contact departure control, which was acknowledged.

One of the pilots then contacted Syracuse Departure Control, and stated that they were passing through 1,200 feet. The departure controller advised the pilot that he was in radar contact, to proceed on course, and to climb to 5,500 feet, which the pilot acknowledged.

At 1836, the controller asked if they were still going to make a VFR practice approach into Oswego County. One of the pilots answered to the affirmative, that they were going to do a practice GPS RWY 24 approach. The pilot and the controller then discussed whether or not to cancel VFR flight following. The pilot requested cancellation, which the controller acknowledged. The controller then advised the pilot to set 1200 as a transponder code, and approved a change of radio frequency.

There were no additional transmissions recorded from the accident airplane.

A radar track confirmed that the airplane proceeded to Oswego County Airport.

A flight instructor, who was on the ground at Oswego County, watching his student pilot conduct a solo traffic pattern flight, reported seeing a Cirrus, "Charlie Delta" touch down on runway 06 about 1840. He recognized the airplane as being a new hangar tenant at the FBO where he worked. The flight instructor knew that there were two owners, but did not notice who was flying or how many people were on board the airplane.

The airplane touched down in the first 1,000 feet of runway. The flight instructor observed all

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three wheels on the ground, then heard a sudden application of power. Rotation occurred quickly, and the airplane made a steep climb. The climb was "well underway" by the time the airplane reached the intersection of runway 15/33, (about 2,000 feet from the approach end of the runway). The airplane reached pattern altitude by the end of runway 06, and pitched forward "abruptly" to arrest the climb, while simultaneously entering the left crosswind. Power appeared to be reduced as the pitch angle was decreased.

The flight instructor lost sight of the Cirrus in the crosswind. He turned his attention to the final approach area, and shortly thereafter observed his student making a full stop landing. As the student was taxiing the airplane to the ramp, the flight instructor saw the Cirrus on final. "The plane made another well-stabilized approach and smooth touchdown. Again there was a sharp application of power, another steep climbout, a quick transition to level flight at pattern altitude, and a simultaneous left crosswind turn."

The flight instructor did not see the airplane return to the airport.

Radar data indicated that a target departed Oswego Airport, and climbed to 5,500 feet, then headed southeast, toward the accident area, maintaining between 5,200 feet and 5,700 feet. En route, it made a left, 90-degree turn, followed by a right 90-degree turn. It then continued southeast, and made a right, approximately 360-degree turn, followed by a left 360-degree turn. The target then continued the left turn, until it was transiting east-southeast, and making smaller left and right turns, until it reached the airspace over the accident site.

Target altitude readouts in the vicinity of the accident site included: 5,600 feet at 1906:14; 5,700 feet at 1906:23; 5,300 feet at 1906:28; 4,400 feet at 1906:32; 3,800 feet at 1906:37; and 3,200 feet at 1906:42.

A witness to the accident was outside his home, about 1/2 mile to the north. The witness was accustomed to airplanes performing maneuvers in the area due to its sparse population. He saw the airplane, and noticed that the pilot would "cut the engine," then descend the airplane, and pull up, recovering with full power. The airplane performed the maneuvers for about 5 minutes, and the witness saw the maneuver repeated "three or four times." The witness stated that he was fairly sure the airplane "probably did a turn" at the end of the pull-ups, but he wasn't sure which direction the airplane may have turned.

After the airplane completed its last pull-up, the witness noticed that it entered another dive. The airplane "suddenly went into a spiral and he went straight down. He seemed to keep a constant speed on his descent and it looked like he was in slow motion spinning. He continued nose down to the tree line and continued straight down to the ground. I did not hear his engine on at all once he went into the spiral. I did not think he had an engine problem and was intentionally cutting the power of his plane and then giving it full power on the climbout."

A second witness was also outside his home, about 1 mile west-northwest of the airplane. When he saw the airplane, it was traveling in an easterly direction. The airplane was "pretty small" and had "plenty of altitude." The airplane "peeled off to the left," and the witness "remembered seeing the bottom of the aircraft." The airplane passed through about 180 degrees of turn, then leveled off, "and right after it came back to level flight it stalled." The airplane "went into a nose dive spin and then a flat spin into the ground." It "tumbled in a downward spiral, which turned into a flat spin because it was basically flat, spinning on its own axis, slightly nose down, like a turning top." The witness believed the engine was running the entire time, and expected the pilot to add power to pull up. He did not hear any sputtering from the engine.

A third witness, who observed the airplane with the second witness, noted that the airplane "rolled over once and then twisted, which looked to be intentional. Suddenly, the plane began doing a nose spin, which turned into a flat spin. It appeared as though the pilot lost control of the plane."

A fourth witness heard a "strange plane noise. It sounded like 'wah, wah, wah.'" He looked up to see the airplane "spiraling nose first, straight towards the ground." As it was descending, he heard "a couple of 'pop' 'pop' noises."

The accident occurred during the hours of daylight, and the accident site was located at 43 degrees, 21.86 minutes north latitude, and 76 degrees, 02.25 minutes west longitude.

PILOT INFORMATION

One of the pilots held a private pilot certificate, with ratings for single engine and multi-engine land airplanes, and instrument airplane. He was also an Aviation Medical Examiner. His latest Federal Aviation Administration (FAA) second class medical certificate was dated December 12, 2000.

According to logbook excerpts provided by a family member, as of April 20, 2002, the pilot had recorded 337 hours of total flight time, of which, 250 hours were in single engine airplanes, 87 hours were in multi-engine airplanes, and 31 hours were in make and model. The excerpts documented four training flights in another SR-22 prior to the acquisition of the accident airplane, and three training flights in the accident airplane. There was no evidence of the pilot previously flying with the other accident pilot.

Post mortem medical examination confirmed that the pilot had been sitting in the airplane's left front seat at the time of the accident.

The other pilot also held a private pilot certificate, with ratings for single engine land airplanes and instrument airplane. His latest FAA third class medical certificate was dated June 8, 2001. A contract flight instructor, who conducted SR-22 flight training with him, estimated that the pilot had about 20 hours in make and model, and believed the accident flight was the first one in which he had flown with the other accident pilot.

The pilot's logbook was not recovered; however, on his Cirrus client profile sheet, dated April 22, 2002, he stated he had 475 hours of flight time, all in single-engine airplanes.

Post mortem medical examination confirmed that the pilot had been sitting in the airplane's right front seat at the time of the accident.

There was no evidence as to which pilot was "pilot in command," or which pilot was at the controls leading up to, or during the accident sequence.

AIRCRAFT INFORMATION

The airplane, serial number 0192, was constructed primarily of composite materials. The two-piece elevator and the rudder were aluminum.

The airplane had fixed landing gear, and electrically controlled, single-slotted flaps.

Pilot controls included conventional rudder pedals, and "single-handed side control yokes" (side sticks) for elevator and aileron control.

The airplane was powered by a Teledyne Continental IO-550-N, six-cylinder, normally aspirated, fuel-injected engine, capable of developing 310 horsepower at 2,700 rpm. The engine drove a three-bladed, Hartzell constant-speed, aluminum-alloy propeller.

The airplane was also equipped with a Cirrus Airplane Parachute System (CAPS).

According to the SR-22 Pilot's Operating Handbook:

"CAPS [is] designed to bring the aircraft and its occupants to the ground in the event of a life-

threatening emergency. The system is intended to save the lives of the occupants but will most likely destroy the aircraft and may, in adverse circumstances, cause serious injury or death to the occupants.

The CAPS consists of a parachute, a solid-propellant rocket to deploy the parachute, a [manually-activated] rocket activation handle, and a harness imbedded within the fuselage structure. A composite box containing the parachute and solid-propellant rocket is mounted to the airplane structure immediately aft of the baggage compartment bulkhead. The box is covered and protected from the elements by a thin composite cover.

The parachute is enclosed within a deployment bag that stages the deployment and inflation sequence. The deployment bag creates an orderly deployment process by allowing the canopy to inflate only after the rocket motor has pulled the parachute lines taut. The parachute itself is a 2400-square-foot round canopy equipped with a slider, an annular-shaped fabric panel with a diameter significantly less than the open diameter of the canopy. A three-point harness connects the airplane fuselage structure to the parachute.

CAPS is initiated by pulling the activation T-handle installed in the cabin ceiling on the airplane centerline just above the pilot's right shoulder. A placarded cover, held in place with hook and loop fasteners, covers the T-handle and prevents tampering with the control. The cover is removed by pulling the black tab at the forward edge of the cover. Pulling the activation T-handle removes it from the o-ring seal that holds it in place and takes out the approximately six inches of slack in the cable connecting it to the rocket. Once this slack is removed, further motion of the handle arms and releases a firing pin, igniting the solid-propellant rocket in the parachute canister."

The airplane's new logbook did not contain time-in-use information. A work order, dated April 19, 2002, listed airframe total time as 19.3 hours. The work order reported a deformation of the landing light housing, and noted that the airplane would be returned to the factory so the light could be repaired under warranty.

The airplane's usable fuel capacity was 81 gallons. The latest refueling occurred on April 22, 2002, when the airplane was "topped off" with 58 gallons of 100-octane low lead avgas. After the accident, the fuel truck and a fuel sample were examined by FAA inspectors, with no discrepancies noted. There were also no problems noted with aircraft subsequently fueled from the truck.

There were no flight data or cockpit voice recording devices installed on the airplane.

METEOROLOGICAL INFORMATION

Weather, recorded at Oswego County Airport at 1854, included winds from 060 degrees true at 6 knots, visibility 10 statute miles, clear skies, a temperature of 54 degrees F, and a barometric pressure of 30.10 inches Hg.

Weather, recorded at Syracuse Hancock International Airport at 1854, included winds from 070 degrees true at 8 knots, visibility 10 statute miles, a few clouds at 24,000 feet, a temperature of 56 degrees F, and a barometric pressure of 30.12 inches Hg.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located on hilly, forested terrain, at an elevation of about 600 feet. With the exception of some broken branches above the wreckage, and a small tree that was cut off next to it, there was no wreckage path through the trees.

Except for the vertical stabilizer and rudder, the airplane was upright, and substantially consumed in a post-impact fire. Remaining airframe material was charred and brittle.

The nose of the wreckage was pointing toward 030 degrees magnetic. The engine came to rest slanted about 20 degrees nose-down, with dirt and roots bulldozed forward, about 1 foot.

The airplane's right aileron, and the trailing outboard edge of the right wing were crushed against a tree. The wing was cocked forward of its normal 90-degree position relative to the fuselage, and the outboard end pointed toward 090 degrees magnetic.

The empennage was burnt and bent to the left side of the airplane, and pointed toward 230 degrees magnetic. The vertical stabilizer and rudder were bent, and broken over the left horizontal stabilizer. The left elevator was separated from the empennage, and not burned. The right elevator was also separated from the empennage, and the right horizontal stabilizer was in a tree almost directly above the empennage.

The left wing was cocked aft of its normal 90-degree position relative to the fuselage, and the outboard end pointed toward 270 degrees magnetic.

All flight control surfaces were accounted for at the accident scene. Control continuity was confirmed from the cockpit area to all flight controls. The flap motor screw position correlated to the flaps being up.

One of the propeller blades was not damaged. Another propeller blade was bent back about 20 degrees, and exhibited leading blade tip damage and rotational scoring. The third propeller blade, which was bent back, and buried beneath the engine, had severe damage, including a large piece broken out of the leading edge, and rotational scoring to the outboard 8 inches.

The engine was burned, and the number 1 cylinder exhibited melting. Crankshaft continuity was confirmed from the front to the rear of the engine. Both magnetos were broken from their mounts, and exhibited severe burning. Neither magneto would turn. The throttle body was burned, and the butterfly valve was jammed in the half-opened position. The alternate air "Y" was partially melted, and the alternate air door was in the "direct" position. The induction tubing was burnt and partially melted. The starter was broken at the mount. Ignition leads were burnt. The fuel manifold (spider) was fire-damaged, but the fuel screen was clean. The fuel pump was burned. The pump was removed, and the pump drive would not turn. The mixture lever was about 1/4 inch above idle cutoff. The exteriors of the spark plugs were burned. The top plugs were removed and internally appeared new. The propeller governor lever was full aft. The engine was retained for further examination.

The cockpit area was consumed by fire. All gauges and switches were destroyed. Throttle, mixture, and propeller control positions could not be determined. All of the seats were destroyed, except the left pilot seat cushion, which exhibited leading edge compression.

The CAPS parachute was found outside the airframe, in its deployment bag, in front of the right wing. The composite CAPS cover was found about 20 feet in front of the airplane, with no damage to its interior (kick plate) face. The solid propellant rocket was located on the ground, aft of the right wing, with cables leading to the wreckage. The propellant was expended. The "maintenance safety pin," which, when installed, ensured that the CAPS activation T-handle could not be pulled, was not located.

On June 18, 2002, the engine was disassembled and examined under Safety Board supervision at the Teledyne Continental Motors facility, Mobile, Alabama. No pre-impact anomalies were found.

MEDICAL AND TOXICOLOGICAL INFORMATION

On April 27, 2002, autopsies were performed on both pilots by the Onondaga County Medical Examiner's Office, Syracuse, New York. Toxicological testing was subsequently performed at the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma.

ADDITIONAL INFORMATION

- SR22 Spins -

According to the SR-22 Pilot's Operating Handbook:

"The SR22 is not approved for spins, and has not been tested or certified for spin recovery characteristics. The only approved and demonstrated method of spin recovery is activation of the Cirrus Airframe Parachute System (See CAPS Deployment, this section). Because of this, if the aircraft 'departs controlled flight,' the CAPS must be deployed.

While the stall characteristics of the SR22 make accidental entry into a spin extremely unlikely, it is possible. Spin entry can be avoided by using good airmanship: coordinated use of controls in turns, proper airspeed control following the recommendations of this Handbook, and never abusing the flight controls with accelerated inputs when close to the stall. If, at the stall, the controls are misapplied and abused accelerated inputs are made to the elevator, rudder and/or ailerons, an abrupt wing drop may be felt and a spiral or spin may be entered. In some cases it may be difficult to determine if the aircraft has entered a spiral or the beginning of a spin.

If time and altitude permit,...determine whether the aircraft is in a recoverable spiral/incipient spin or is unrecoverable and, therefore, has departed controlled flight.

WARNING

In all cases, if the aircraft enters an unusual attitude from which recovery is not expected before ground impact, immediate deployment of the CAPS is required. The minimum demonstrated altitude loss for a CAPS deployment from a one-turn spin is 920 feet. Activation at higher altitudes provides enhanced safety margins for parachute recoveries. Do not waste time and altitude trying to recover from a spiral/spin before activating CAPS.

- CAPS Enhancements -

On February 28, 2002, Cirrus Design Corporation issued Service Bulletin (SB) 20-95-02, which became effective on March 19, 2002. According the service bulletin, "some production airplanes may exhibit a condition where the pull force required to activate the CAPS may be greater than desired."

The service bulletin also described means of compliance, which included: "install a cable clamp to positively restrain the cable housing at the CAPS Handle Adapter, loosen and straighten the activation cable above the headliner, and remove [an] Adel clamp securing the activation cable adjacent to the rocket cone adapter."

According to the manufacturer's production records, the accident airplane was in compliance with SB 20-95-02.

On March 16, 2002, a Cirrus SR-20 was substantially damaged, and the pilot and pilot-rated passenger sustained minor injuries during an emergency landing in Lexington, Kentucky. According to the factual report, NYC02LA071, the pilot reported that he had pulled the CAPS activation handle repeatedly; however, the cable did not extend, and "nothing seemed to happen." The airplane struck trees, and witnesses reported that the CAPS parachute deployed after ground impact. The airplane was not in compliance with SB 20-95-02.

On October 3, 2002, a Cirrus SR-22 was substantially damaged, and the pilot was uninjured during a forced landing, after separation of the left aileron following maintenance. According to the preliminary report, FTW03LA005, the day before the accident, SB 20-95-05 and SB A22-27-03, trim cartridge self-locking nut replacement, were incorporated. Compliance with SB A22-27-03 would have required removal and reinstallation of the left aileron.

During the first flight after the maintenance, with the airplane at 2,000 feet, the pilot felt a pull to the left, and saw that the left aileron was "separated at one hinge attach point." The pilot declared an emergency, climbed the airplane to 2,500 feet, headed it into the wind, shut down the engine, and deployed the CAPS. The airplane subsequently descended to the ground by parachute, and came to rest upright, in a field of mesquite trees.

- Roll and Yaw Trim Cartridge Shaft Retention -

According to Cirrus Design Corporation Director of Safety, on September 16, 2002, a company pilot reported an in-flight loss of right rudder control during a production test flight. After landing, the company discovered that the yaw spring self-locking rod-retaining nut had backed off, and released spring tension, creating a "potential of control loss and/or jamming."

The director also stated that the roll trim cartridge utilized the same shaft and self-locking nut as the yaw trim cartridge, and that "the root cause was attributed to the run down torque being below minimum tolerance on certain production spring cartridges. A 100 percent sampling of stocked items showed an occurrence of 20 percent."

As a result of the incident, the company issued SB A22-27-03, which provided "instructions on replacing current self-locking nuts on roll and yaw trim cartridges with new self-locking nuts with a higher axial load capability."

On September 28, 2002, Safety Board and Cirrus personnel reexamined the wreckage at a storage facility. Both trim cartridges were located, and both retaining nuts were found installed on their respective cartridge shafts. Although the cartridges exhibited impact and fire damage, there was no evidence of jamming.

On April 26, 2002, the wreckage, with the exception of the engine, was released to a representative of the owners' insurance company. The engine was released on June 18, 2002, following disassembly and examination.

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N286CD 20050206

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HISTORY OF FLIGHT

On January 23, 2002, at 1653, Pacific standard time, a Cirrus SR 20, N893MK, collided with power lines near San Jose, California. The private pilot/owner was operating the airplane under the provisions of 14 CFR Part 91. The airplane was destroyed. The pilot, the sole occupant, sustained fatal injuries. The personal cross-country flight departed Napa County Airport (APC), Napa, California, at 1600, en route to Reid-Hillview Airport of Santa Clara County (RHV), San Jose. Day instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan had been filed. The primary wreckage was located at 37 degrees 16 minutes north latitude and 121 degrees 43 minutes west longitude.

During the investigation, the recorded voice channels from the Federal Aviation Administration (FAA) Northern California Terminal Radar Approach Control (NCT), Palo Alto ATCT, and Reid-Hillview ATCT were examined. Recorded radar data from the NCT ARTSIIIA system was also reviewed.

During the initial portions of the flight after takeoff from Napa, ATC issued numerous radar vectors and altitude assignments to the pilot for traffic avoidance purposes. Review of the radar data disclosed that the pilot complied with all instructions. At 1627, when the airplane was approximately abeam Oakland International Airport, the NCT Saratoga sector controller instructed the pilot to proceed to navigational fixes near Palo Alto airport (PAO). The pilot questioned the clearance, and in the subsequent exchanges the controller acknowledged his mistaken belief that the pilot was destined to PAO and that the flight was actually destined to RHV. The controller asked the pilot from which fix he would like to initiate the approach, and the pilot requested vectors to the approach "around OZNUM." OZNUM is the Final Approach Fix (FAF) on the RHV GPS 31R procedure. The controller issued a clearance direct to OZNUM. After this exchange, radar indicated the airplane turned almost 90 degrees to the right, and tracked on a course consistent with proceeding direct to PAO. The controller noticed the course deviation, and queried the pilot. The controller provided no specific headings, but told the pilot to make a right turn to avoid traffic associated with San Jose International Airport, and to proceed to OZNUM, which he said was "on the east side of RHV." The pilot acknowledged and made a right turn of approximately 270 degrees, briefly tracking on an approximately southbound course, which did not appear to be aligned with any relevant navigational fix. After approximately 3 miles on that course, the pilot turned left to a track consistent with proceeding direct to OZNUM. The radar data showed that this ground track resulted in the airplane flying overhead RHV, on approximately the reciprocal of the final approach course, i.e., aligned with RHV, and the fixes OZNUM, then ECYON.

In his interview, the first NCT LICKE sector controller (L1) said he became aware of N893MK when he overheard the Saratoga sector controller correcting the pilot's course to OZNUM. The L1 controller said he believed the pilot required extra attention and intended to provide what assistance he could.

Comparing the voice transcripts to the recorded radar data showed that upon the pilot's initial contact with the LICKE sector, the airplane had passed OZNUM, and begun a slight left turn to the east. At this point the pilot had no further clearance to follow, since the Saratoga controller had cleared him direct to OZNUM with the expectation that L1 would provide vector service. L1's initial instruction was for the pilot to proceed direct to ECYON; the pilot's response was to

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question the fix. According to L1's statements, he recalled that the airplane was in a position coincident with a downwind leg, and the turn toward ECYON would work out to be the same as a vector to final. Recorded radar data indicates the airplane was flying a course approximately aligned with the Initial Approach Fix (IAF) ZUXOX. Shortly after this exchange, L1 noted the airplane appeared to begin a left turn towards OZNUM, but he instructed the pilot to turn right toward ECYON in order to remain clear of a higher terrain area. At this time, OZNUM was directly behind the airplane, and ECYON at about the four o'clock position. The pilot completed a right turn, briefly flying a course consistent with tracking towards OZNUM, then made a slight left turn and flew a course consistent with the published segment between ZUXOX and ECYON. L1 said he observed the pilot on this course and issued clearance for the approach.

FAA Order 7110.65 specified that Standard Instrument Approach Procedures "shall commence at an Initial Approach Fix or an Intermediate Approach Fix if there is not an Initial Approach Fix. Where adequate radar coverage exists, radar facilities may vector aircraft to the final approach course [by assigning] headings that will permit final approach course interception on a track that does not exceed 30 degrees." The order further states that vectors should be issued if required to intercept the final approach course. ECYON was not an IAF. Review of the radar derived ground track revealed that the intercept angle was about 40 degrees.

While the flight was progressing between ECYON and OZNUM, a controller change occurred at LICKE sector. L1 advised the second controller (L2) that N893MK was on the approach and the only remaining task was to issue frequency change to RHV tower. As the airplane passed just northwest of OZNUM, L2 instructed the pilot to contact the tower on frequency "118.6." This frequency is actually assigned to PAO tower. The pilot queried the controller if that was actually correct. The controller insisted, "Yes sir, it is." The pilot complied and contacted PAO tower. The pilot and the PAO controller discussed that he was on the wrong frequency and the pilot said he would switch to the RHV frequency of 119.8. During this conversation, radar indicated the airplane began a turn to the right, with the first target visibly displaced from the final approach course at 1652:33, approximately over JOPAN waypoint. At 1652:50, the pilot reported to RHV tower "descending from JOPAN two thousand feet five point four miles from missed approach point." Radar data agreed with the pilot's report; however, the course had diverged almost 90 degrees from the final approach course.

Within 2 seconds of the pilot making initial contact with RHV tower, the ARTS Minimum Safe Altitude Warning System (MSAW, see ATC Group factual report in docket material) provided a visual and audible alert at the RHV tower and NCT. In response to the pilot's call, the RHV tower controller cleared the pilot to land then said "low altitude alert, check your altitude immediately." The MSAW system activates whenever the targets projected track will encounter higher terrain, or, when the mode C reported altitude is below the minimum safe altitude for the navigational segment being flown. Based on the radar data, the airplane's projected track was diverging away from the centerline of the approach, and toward higher terrain. At the time of the alert the airplane was at about 1,900 feet, and the minimum altitude for the final segment is 1,440 feet. About 30 seconds later, the tower controller notified the pilot that he appeared off course. The pilot made a brief unintelligible transmission and no further radio or transponder signals were received.

The radar track of the airplane was lost in the area of high-tension power lines, located 6.7 miles south east of RHV at an altitude of 1,600 feet mean sea level (msl). The last radar data with an altitude return was at 16:53:40, and showed the airplane at a mode C reported altitude of 1,700 feet.

PERSONNEL INFORMATION

A review of FAA airman records revealed the pilot held a private pilot certificate with an airplane single engine land and instrument airplane rating. The pilot was issued a third-class medical on June 8, 2001, with the limitations the pilot must wear lenses for distant vision, and possess glasses for near vision.

An examination of the pilot's logbook indicated a total flight time of 460.7 hours, of those 362.4 hours were dual received. The pilot had logged his total IFR time as 150.3 hours of which 10.7 hours were actual IFR. He had 334 hours in this make and model; 84.8 hours were logged in the last 90 days.

The pilot had completed and passed an instrument airplane check ride on January 6, 2003. The designated examiner (DE) was interviewed and related the pilot was very detail orientated, and also very knowledgeable about the Cirrus SR 20.

AIRCRAFT INFORMATION

The airplane was a Cirrus SR 20, serial number 1038. A review of the airplane's logbooks disclosed the annual inspection was completed on February 20, 2002. Total airframe time was listed as 67.8 hours and a Hobbs time of 67.8 hours. The airplane had a total time of 369.3 hours.

The transponder and altimeter/static and altitude reporting systems were inspected on February 20, 2002.

A Teledyne Continental Motors IO-360ES-6B engine, serial number 357190, was installed in the airframe in May 2000. The engine had a total time of 369.3 hours.

An aircraft weight and balance report dated February 18, 2002, revised the airplane's weight and balance data sheet. It listed the new empty weight as 2121.23 pounds; total moment of 296507.35-inch pounds, and listed the empty center of gravity as 139.78 inches aft of the datum.

The Cirrus SR 20 uses conventional flight controls for ailerons, elevator, and rudder. The control surfaces are pilot controlled through either of two single-handed side control sticks mounted on each side of the airplane's cockpit.

The neutral position of the left side stick is at a 45-degree angle to the right. The neutral position of the right side stick is a 45-degree angle to the left. The accident airplane was being flown from the left pilot seat. A pilot flying from the left seat would rest his left-hand on the side control stick; any inadvertent pressure applied by the pilot could potentially induce an unintentional right turn of the airplane.

The accident airplane (SN 1038) was originally equipped with the factory "Avionics Configuration C" package which included dual Garmin GNS 430's. The GNS 430 is a combination global positioning satellite (GPS) receiver, communication, and navigation system. The GNS 430's were mounted in the center console of the airplane below the ARNAV ICDS 2000 display.

A major repair and alteration (FAA Form 337) dated February 20, 2002, was filed reporting an upgrade in the avionics, which were installed in the airplane. The transponder was upgraded; a Ryan 9900BX traffic collision avoidance detection (TCAD) system; and a WX-500 stormscope system were installed.

AIRPORT, NAVIGATION FACILITIES AND APPROACH INFORMATION

The Airport/ Facility Directory, Southwest U. S., indicated RHV runway 31R was 3,101 feet long and 75 feet wide. The runway surface was asphalt. The only IFR approach into RHV is the GPS RWY 31R.

According to a review of facility records, all relevant ATC and navigational equipment was operating. There were no NOTAMs or other evidence of any GPS anomalies in the vicinity of RHV. The GPS 31R approach procedure was a fairly new procedure, prior to the

establishment of this approach, RHV did not have any Standard Instrument Approach Procedures.

During interviews with the controllers at NCT and RHV they reported that they had been briefed on the approach procedure, and were generally familiar with it, although it did not receive heavy use.

The RHV GPS 31R approach course was established in a congested area of high traffic density associated with the airports in the southern San Francisco Bay area. The final approach course closely paralleled the SJC approach course to the southwest, such that airplanes established on these approaches were separated by the minimum allowed lateral distance. To the northeast, terrain rose rapidly, leaving very little room to maneuver for airplanes below 4,000 feet.

Review of the radar display terminals at NCT disclosed that video mapping did not directly depict the GPS 31R final approach course. In order to visualize the course, controllers had to visualize a line between the airport symbol, and the OZNUM and EYON waypoint symbols.

The RHV Tower Remote ARTS Color Display (R-ACD) video map did include a depiction of the final approach course as a series of dashed lines. Depictions of JOPAN and OZNUM waypoints also appeared on the map. In their interviews, the controllers noted the waypoint symbols are quite large; the investigators observed that the "points" on the symbols extended approximately 0.75 miles beyond the centerline of the approach course.

ARTS radar targets on the controllers display were oriented such that the longer dimension of the return was aligned perpendicular to the azimuth from the radar site, (i.e. "broadside") and a target whose track is diverging from the final approach course would not be readily apparent. This topic is discussed in detail in the ATC Group Factual Report, which is contained in the docket for this accident.

METEOROLOGICAL CONDITIONS

The closest official weather observation station was Reid-Hillview Airport of Santa Clara County (RHV), San Jose, located 6.7 nautical miles (nm) northwest of the accident site. The elevation of the weather observation station was 133 feet msl. A special aviation weather report (METAR) for RVH was issued at 1653. It stated: skies 1,200 feet broken, 8,000 feet overcast; visibility 4 miles; winds from 280 degrees at 12 knots; temperature 60 degrees Fahrenheit; dew point 59 degrees Fahrenheit; and altimeter 30.24 inHg.

WRECKAGE AND IMPACT

The terrain at the accident site was mountainous. The airplane came to rest approximately 650 feet on a bearing of 032 degrees from the first identified point of contact (IPC). The accident site was at the bottom of a ravine. The airplane came to rest on a magnetic heading of 056 degrees at an almost level attitude on the upslope side of a 45-degree slope.

The first identified point of contact (IPC) was the west side static line approximately 100 feet south of the Pacific Gas and Electric (PG&E) high-tension power line tower number 130. The second identified point of contact was the pair of 500 KV power lines located on the east side of the PG&E tower number 130. One of the power lines was lying on the ground adjacent to tower number 130; it had pieces of fiberglass imbedded in a broken bracket, which is used to suspend the power lines from the tower. Approximately 6 feet north of the broken bracket were witness marks on the wire that appeared to be at a 45-degree cut into the power line. The power lines are approximately 2 inches across.

All of the airplane's flight control surfaces were at the accident site. The rudder, elevators, and horizontal stabilizer assemblies were attached to the empennage. All control surfaces and their associated mass balance weights were in the debris field.

The outboard section of the left wing was in a tree approximately 160 feet northeast of the IPC. The left wing section displayed charring. On the left wing section approximately 3 feet inboard from the wing tip, there was a semicircular depression approximately 2 inches across.

The airplane was equipped with an emergency ballistic parachute system. The ballistic parachute system had not been deployed. The safety pin, which is used to prevent inadvertent deployment, was still in place. The safety pin had a tag attached to it that is red in color with white lettering and read, "SAFETY PIN REMOVE BEFORE FLIGHT."

MEDICAL AND PATHOLOGICAL INFORMATION

The Santa Clara County Coroner completed an autopsy. The FAA Toxicology and Accident Research Laboratory performed toxicological testing of specimens of the pilot. The results of analysis of the specimens were negative for carbon monoxide, cyanide, and volatiles.

Results for tested drugs were; 0.015(ug/ml, ug/g) Dextromethorphan detected in blood, Dextromethorphan present in urine, Dextrophan detected in blood, Dextrophan present in urine, Ephedrin detected in urine, Phenylpropanolamine detected in blood, Phenylpropanolamine present in urine, Pseudoephedrine present in blood, Pseudoephedrine present in urine, and 29.5(ug/ml, ug/g) Acetaminophen detected in urine.

TESTS AND RESEARCH

Investigators examined the wreckage at Plain Parts, Sacramento, California, on January 26-27, 2003.

Investigators removed the engine. The engine was suspended from a hoist; the top spark plugs were removed. All spark plugs were clean with no mechanical deformation. The spark plug electrodes were gray in color, which corresponded to normal operation according to the Champion Aviation Check-A-Plug AV-27 Chart.

Investigators attempted to rotate the engine using the accessory side of the engine but were unable to manually rotate the engine. The crankshaft flange was broken off, and bent.

Investigators manually rotated the magnetos, and both magnetos produced spark at all posts for cylinders.

The vacuum pump was broken from the engine mounting point. The coupler was bent but intact. The pump could not be rotated by hand. Disassembly of the vacuum pump revealed that the rotor was fractured in three places radially from the center out, and the vanes were intact.

The oil sump screen was clean and open. The governor screen was clean. The oil screen filter was clean.

The fuel pump's rubber diaphragm was unbroken and investigators blew air through the lines. The plunger in the fuel distribution valve moved freely, the rubber diaphragm was unbroken, and investigators did not observe any contamination. The fuel nozzles were open and the screens were clean.

The fuel selector valve was between the left and right positions, slightly towards the right tank.

The aircraft uses three cable loops to control the aircraft's three-axis control surfaces: ailerons, rudder, and elevator. All cables start and end their runs from the front of the airplane and are routed to the various controls via a (forward) six and (aft) four gang pulley system. The ailerons use two "kick-out" pulleys to route the aileron cables from the front of the aircraft outboard to the aileron pulleys located in the outboard one third of each wing. The right aileron cable was intact and on the right aileron pulley. The left aileron cable was intact and on the left aileron

pulley. The elevator and rudder cables are routed to the 306-bulkhead pulley cluster that activates the rudder and elevator control arms attached to their respective pulleys. The aircraft utilizes a rudder / ailerons interconnect system ("RAI") to add rudder input when the pilot deflects the ailerons.

The forward (six-gang) and aft (four-gang) control cable pulleys were intact and the control cables were still on their respective pulleys. The cable retainer on the six-gang pulley was bent, but secure. The four-gang pulleys were also intact, although the four control cables were slack since recovery personnel had purposely cut them during the retrieval process.

Inspection of the Rudder Aileron Interconnect (RAI) revealed that all RAI components were intact. All cables were intact and on their respective pulleys.

The central aileron pulley was bent aft at the 5-7 o'clock position; the cable was attached and intact. The cable was attached and intact on the central pitch pulley sectors. The rudder cables were attached and intact on their rudder bars. Control cable continuity was established throughout the control system.

The right-hand side controller linkages to the main control pulley and pulley sectors were intact; the left side controller linkages were destroyed by the impact forces and could not be inspected.

The flap actuator was measured at 11 inches. The factory representative reported this corresponded to the fully retracted (Up) position. The elevator pitch trim motor was toward a "nose up" position.

The airplane was equipped with an ARNAV ICDS-2000, which is a VFR moving map, and with the installed EMM-35 (engine monitoring module) also displayed engine data. The displayed data included cylinder head temperature (CHT), engine gas temperature (EGT), engine rpm, and fuel flow. The ICDS stores the data in 1-minute intervals. The ICDS-2000 and the EMM-35 were removed from the airplane and shipped to the manufacturer for further analysis.

On March 17, 2003, a National Transportation Safety Board investigator was present at the RNAV Systems Inc., Puyallup, Washington, during the inspection of the ARNAV ICDS-2000 and the EMM-35. The data recovered from the data storage card indicated that the accident airplane, on the date of the accident had departed RHV, flown to APC, shut down the aircraft systems for 43 minutes, and then flown from APC to the area of the accident. The total elapsed time was 3 hours 5 minutes.

The engine assembly was removed from the airframe and shipped to the engine manufacturer, Teledyne Continental Motors (TCM) for further examination.

On April 23, 2003, investigators from the Safety Board, Cirrus Design, and TCM examined the engine at the TCM factory Mobile, Alabama.

The engine was disassembled and examined. No abnormalities were found to preclude engine operation prior the impact.

[PDF File](#)

N116CD 20010410

Home

LAX01FA145

N254SR 20071230

HISTORY OF FLIGHT

N414CD 20071128

N482SR 20071125

N108GD 20071121

N901SR 20070202

N457S 20061218

On April 10, 2001, about 1850 mountain standard time, a Cirrus SR20 single engine airplane, N116CD, collided with mountainous terrain and burned northwest of Sierra Vista, Arizona. The airplane was destroyed, and the noninstrument rated private pilot and two passengers received fatal injuries. The airplane was registered to, and operated by, the pilot/owner as a personal flight under the provisions of 14 CFR Part 91. The flight originated from the Tucson, Arizona, International Airport at 1830, with Belen, New Mexico (E80), as the intended destination. Instrument meteorological conditions prevailed at the accident site and no flight plan had been filed.

N665CD 20061130

The pilot and two passengers were from Wisconsin, and were in Tucson visiting relatives. According to air traffic control records, the pilot radioed the Tucson Clearance Delivery requesting a visual flight rules (VFR) clearance, with a heading of 100 degrees at 3,800 feet to E80. After takeoff, the pilot was instructed to turn to a heading of 120 degrees and to expect an on course clearance from the next controller, and was then instructed to contact departure control. Departure control instructed the pilot to make a left turn to a heading of 030 degrees. The controller then verified the pilot's requested heading and cleared the flight to turn on course. At 1843, radar service was terminated and the pilot was instructed to squawk VFR (transponder code 1200), to which the pilot acknowledged.

N969ES 20061027

N121LD 20061025

N929CD 20061011

N787SL 20060915

N91MB 20060828

Concerned family members reported the aircraft overdue when it failed to arrive as scheduled. Civil Air Patrol initiated a search and personnel located the accident site on April 14, 2001. The burned wreckage was located approximately 150 feet below the crest of a ridgeline in the Whetstone Mountains, at 5,200 feet mean sea level (msl). The accident site was approximately 52 nautical miles southeast of Tucson. Belen is located northeast of Tucson.

N8163Q 20060711

N667WP 20060204

N526CD 20060109

PERSONNEL INFORMATION

N799TM 20051229

The noninstrument rated pilot held a private pilot certificate with an airplane single engine land rating. He was issued a third-class medical certificate on January 24, 2000, with a limitation to wear corrective lenses. According to his last medical application, the pilot reported having accumulated a total of 1,450 hours of flight time. Utilizing the aircraft maintenance records, Safety Board investigators estimated that the pilot accumulated approximately 116.6 hours of flight time in the accident airplane as of February 6.

N621PH 20051211

N286CD 20050206

N6057M 20050120

N889JB 20050115

According to Cirrus Design, the pilot received SR20 familiarization training between February 3 and February 6, 2000. The training course consisted of five ground training lessons and four flight training lessons. The flight training consisted of basic flight maneuvers, takeoffs and landings, stalls, global positioning system (GPS), emergency procedures, and instrument flying familiarization. The instrument portion covered procedures for recovery from visual flight rules (VFR) flight into instrument meteorological conditions (IMC).

N1159C 20041204

N1223S 20040910

N8157J 20040419

AIRCRAFT INFORMATION

N100BR 20031012

N9523P 20030118

The single engine, composite airplane was powered by a 200-horsepower Teledyne Continental IO-360-ES engine and a 3-blade, constant speed Hartzell propeller. The airplane was equipped with an airspeed indicator, attitude indicator, altimeter, turn coordinator, heading

N566T 20021103

N901CD 20020528

N837CD 20020424

N893MK 20020123

N116CD 20010410

indicator, and vertical speed indicator. It was also equipped with two Garmin 430 radio/GPS/COMNAV/moving maps and an ARNAV ICDS-2000 Multi Function Display (MFD) with a 10-inch screen. The ARNAV unit displays navigational waypoints, course line, ground speed and other information, which is fed to the ARNAV screen from the No. 1 Garmin 430 radio. The ARNAV unit also has a separate database, which displays terrain elevations based on position. The Garmin 430 is approved for instrument flight rules (IFR) operation; however, the ARNAV MFD is for reference only, and is not certified for flight in instrument conditions.

The accident airplane was equipped with a ballistic recovery parachute system, manufactured by Ballistic Recovery Systems (BRS). According to Cirrus Design, the Cirrus Airframe Parachute System (CAPS) is a ballistic recovery device that will lower the entire airframe to the ground when all alternatives to land the aircraft have been exhausted. The CAPS consists of a parachute, a solid propellant rocket to deploy the parachute, a rocket activation handle, and a Kevlar harness imbedded within the fuselage structure. The pilot activates the system by pulling on a T-handle mounted on the cockpit ceiling. This action activates the firing pin mechanism, which in turn ignites the solid propellant rocket in the parachute canister.

The aircraft was manufactured and issued an airworthiness certificate in the beginning of 2000. The only and last annual inspection was conducted at the Cirrus Design factory service center between February 5 and February 16, 2001. At that time, the aircraft and engine had accumulated 116.6 hours total time. According to the annual inspection discrepancy list, the turn coordinator was found to be inoperative and was replaced. All applicable service bulletins were complied with at the time of the annual inspection. It is not known how many hours the aircraft had accumulated after the annual inspection up until the time of the accident.

METEOROLOGICAL INFORMATION

One of the local sheriff's deputies, who is a pilot and lives approximately 2 miles from the base of the Whetstone Mountains, said the weather the day of the accident was "terrible" with icing, sleet, snow, rain, and wind, and he could not see the base of the mountains from his home.

A printed copy of weather information, dated April 10, 2001, was found scattered around the accident site. The printed sheets appeared to be incomplete, and included weather information from Arizona to Wisconsin. The information included winds aloft information, notices to airmen, current weather (METAR), terminal forecasts (TAF), and text weather radar data. It is uncertain whether more of the weather information was burned in the wreckage.

A section of the printed weather information found at the accident site concerned a terminal forecast for Albuquerque, New Mexico, (issued at 0535 on the 10th). This TAF indicated between 1800 and 2300 the wind would be from 270 degrees at 20 knots gusting to 30 knots; visibility would be greater than 6 miles; ceilings would be broken at 7,000 feet; and showers may be in the vicinity.

According to Flight Service Station archived information, the pilot obtained DUATS weather information at 0709 and 0926 on the morning of the accident.

The Safety Board conducted a meteorological study and the following are excerpts of the findings:

Surface analysis charts prepared by the National Weather Service (NWS) for 1700 and 2000, on April 10th, showed closely packed isobars over Arizona and New Mexico oriented in a northwesterly-southeasterly direction. The 850 and 700 millibar charts for 1700, showed station plots on both charts that generally indicated westerly winds over Arizona at 20-25 knots. The 700 millibar analysis chart showed narrow temperature-dew point spreads at Albuquerque, Tucson, and Flagstaff, which indicated a nearly saturated atmosphere at these locations.

The closest weather reporting facility was located at the Safford Regional Airport (SAD), which was 11 nautical miles south-southeast of the accident site. At 1850, the weather observation facility reported the wind from 290 degrees at 12 knots; visibility 10 statute miles; a few clouds at 6,000 feet agl, and scattered clouds at 8,000 feet agl; temperature 4 degrees Celsius; dew point 1-degree Celsius; and an altimeter setting 29.94 inches of mercury. The remarks section of the 1850 report indicated that the rain began at 1755 and ended at 1834.

At 1855, the weather observation facility at the Tucson International Airport (TUS), located approximately 34 nautical miles northeast of the accident site, reported the wind from 280 degrees at 10 knots gusting to 17 knots; visibility 10 statute miles; broken clouds at 7,500 feet agl; temperature 11 degrees Celsius; dew point -5 degrees Celsius; and an altimeter setting of 29.99 inches of mercury. The remarks section of that report indicated rain and snow showers were in the distant northeast-east moving east.

Review of the 1555, 1655, 1755, and 1855 weather observations for TUS and the Davis Monthan Air Force Base (DMA, which is located approximately 6 nautical miles northeast of TUS), revealed each observation had remarks that indicated snow showers were over the mountains, northeast through the southeast, and they were moving east.

The Pilot Reports (PIREPS) were reviewed and the following were selected from the Tucson area:

At 1704, over Tucson, the flight crew of a Boeing 727 at 2,700 feet, reported "low level wind shear +/-10 knots indicated airspeed during climb [from] runway 29R."

At 1710, at a location 12 nautical miles on a 090-magnetic bearing from Tucson, the flight crew of a MD80 reported light to moderate clear icing at 11,000 feet.

Review of weather radar data at 1846, 1851, and 1856, revealed that precipitation reflectivities in the accident area did increase during these observations; however, no significant weather radar returns were shown in the vicinity of the accident site.

Geostationary Operational Environmental Satellite-10 (GOES-10) visible and infrared data centered on southeastern Arizona area during the period between 1800 and 1900, were obtained and examined. The visible data did not provide any useful information after 1830 due to darkness. Satellite data indicated that a band of clouds stretched across the I-10 corridor east of Tucson from the Rincon Peak area north of I-10 to the vicinity of the Whetstone Mountains south of the highway.

The area forecast for Arizona, specifically south and east of TUS, reported a chance of broken clouds at 6,000 feet, broken clouds at 11,000 feet with tops at flight level 220, and scattered light rain showers. The forecast indicated the conditions would slowly improve from the west, becoming scattered clouds at 8,000 feet over the entire Arizona area around 2100.

AIRMET TANGO, for an area of moderate turbulence, was issued at 1525, the day of the accident, and was valid until 1900, that evening. The area included in AIRMET TANGO included the departure airport, the accident area, and the destination airport.

AIRMET SIERRA, for areas of mountain obscurement, was issued at 1422, the day of the accident, and was valid until 1900, that evening. The area included the departure airport and the accident site. AIRMET SIERRA also indicated that the mountain obscurement conditions would end to the west and south of a line extending from Phoenix to St. Johns, Arizona, between 1800 and 1900; however, the remaining area of that the AIRMET would have continued mountain obscurement in clouds and precipitation beyond 1900 through 0100, on April 11, 2001.

AIRMET ZULU, for occasional moderate rime/mixed icing in clouds and precipitation below 16,000 feet, was issued at 1245, and was valid until 1900, and included the departure airport

and accident site area.

All three AIRMETS were updated at 1845 (approximately 5 minutes prior to the accident). The 1845 AIRMETS for turbulence, IFR conditions and mountain obscurement, and freezing levels were valid until 0100 on the 11th, and included an area surrounding the arrival portion of the route of flight, the flight's destination airport.

At 1622, on April 10, 2001, a TAF for Tucson was issued and was valid from 1700, on the 10th until 1700, on the 11th. According to that TAF, the forecast called for wind from 270 degrees at 14 knots gusting to 24 knots; visibility greater than 6 miles; and clouds broken 6,000 feet. The forecast also indicated temporary conditions between 1700 and 1900, that included light rain showers, small hail, and cumulonimbus clouds broken at 3,500 feet. There is no indication the pilot obtained this TAF prior to departing since the last recorded DUATS information was obtained at 0926.

Astronomical data on April 10, for the approximate accident location, at an elevation of 5,200 feet msl, were calculated using Safety Board software package. According to the calculations, sunset occurred at 1853, and the end of civil twilight followed at 1918. The moon was located approximately 33 degrees below the horizon.

WRECKAGE AND IMPACT INFORMATION

On April 16, 2001, the Safety Board investigator examined the wreckage at the accident site with the assistance of investigators from Cirrus Design and BRS. The wreckage distribution was localized within about a 50-foot radius of a single ground disturbance scar on the approximate 35-degree slope of the mountain.

The lowest items found on the mountain were the top and bottom skins of the horizontal stabilizer followed uphill by the vertical stabilizer, landing gear, and pieces of the cabin. The wing spar remained on the lower side of the burn area, and the left and right flaps were aft of the spar on their respective sides of the wreckage. The top side of the right wing came to rest inverted approximately 50 feet to the right and uphill of the main wreckage area. The fuselage and cabin area were consumed by fire. Most of the fuselage material burned, and none of the cockpit instruments, avionics, or autopilot readings or indications were available. Flight control continuity was not confirmed due to the extent of the damage; however, control cables remained attached to the ailerons.

The engine came to rest within the main wreckage and burn area; however, it was canted approximately 80 degrees to the right when compared to the wreckage distribution direction. The propeller was separated from the engine, with one of the propeller blades separated from the propeller hub. All three blades displayed leading edge gouging and chordwise scoring, and one blade had the tip torn off.

It was noted that the BRS was not deployed. Though the BRS rocket fuel was expended, there was no apparent impact damage noted on the door that covers the parachute and rocket launching system. The rocket motor strike plate on the door did not show any signs of rocket motor impact, and the door was found in the main wreckage area. The parachute remained packed in its container and remained attached to the Kevlar parachute harness. Approximately 8-10 feet of the suspension lines were laid out among the wreckage. The parachute was pulled away from the wreckage and the remaining length of the suspension lines extended easily with no binding noted.

On April 17, 2001, the aircraft wreckage was recovered and transported to Air Transport, Phoenix, Arizona, for further examination.

On April 18, 2001, the wreckage was laid out and it was noted that all four corners of the airplane were present at the accident site, and all flight controls were accounted for. The flap

jackscrew was separated from the flap transmission, and the flap selector switch was not recovered. The fuel selector valve was found selected to the right fuel tank.

The engine crankshaft was fractured just aft of the propeller flange and exhibited 45-degree shear lips with blue tinting at the fracture surface. The fuel pump, propeller governor, induction system, oil sump, front right/lower crankcase, lower portion of the accessory case, oil cooler, magnetos, starter, and alternators were found separated from the engine. Internal examination of the engine revealed that all six connecting rods and pistons were intact. Lubrication was present throughout the interior of the crankcase and no discoloration was noted.

TESTS AND RESEARCH

Cirrus Design personnel examined an exemplar aircraft with the same ARNAV/Garmin 430 unit and database as the accident aircraft. The accident site location was entered into the system and it was noted that the ARNAV database displayed the terrain elevations correctly.

PATHOLOGICAL INFORMATION

A toxicological test for volatiles and drugs was conducted on the pilot. The results were positive for 38 mg/dL of ethanol detected in the heart; 36 mg/dL acetaldehyde detected in the heart; 1 mg/dL 2-butanol detected in the heart; 1 mg/dL n-propanol detected in the heart; 37 mg/dL ethanol detected in the lung; 13 mg/dL acetaldehyde detected in the lung; and 2 mg/dL n-propanol detected in the lung. No drugs were detected in the muscle.

The aforementioned toxicology results may have resulted from post-mortem ethanol production due to the length of time between death and specimen collection; however, that could not be conclusively determined with the specimens that were available.

[PDF File](#)



Critical Decision Making Seminars