Aviation Investigation Final Report

Location:	Silver City, New Mexico	**Accident Number:**	CEN14FA249
Date & Time:	May 23, 2014, 15:53 Local	**Registration:**	N536G
Aircraft:	RAYTHEON AIRCRAFT COMPANY G36	**Aircraft Damage:**	Destroyed
Defining Event:	Aerodynamic stall/spin	**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was returning from a local flight and the pilot flew a tight downwind leg for landing on runway 35, possibly due to a direct crosswind in excess of 20 knots. During the base turn, the airplane overshot the final course, and the pilot used at least 60 degrees of bank to correct the airplane back on course and over the runway. The airplane then bounced and touched down at least 20 knots above the manufacturer's published approach speed with about 1,810 ft remaining on the runway. The airplane's airspeed began to rapidly decrease, but then several seconds later, the airplane's airspeed increased as the pilot rejected the landing. The airplane did not gain significant altitude or airspeed then began a slight right turn. The airplane's roll rate then sharply increased, and the airplane quickly descended, consistent with a stall, before colliding with a transmission wire and terrain. Examination of the airframe and engine did not reveal any preimpact anomalies that would have precluded normal operation. Strong, variable, gusty wind, with an environment conductive to the formation of dry microbursts, was present at the airport at the time of the accident. Several lightning strikes were recorded in the vicinity of the accident site around the time of the accident. It is unknown if the presence of lightning or wind impacted the pilot's inflight decision-making in the pattern, on approach, or during the attempted go-around. The circumstances of the accident are consistent with an in-flight encounter with a strong tailwind and/or windshear during climbout after the rejected landing.

An autopsy conducted on the pilot identified significant stenosis of a distal coronary artery without any other evidence of cardiac distress; however, if there was an associated medical event, the condition would likely result in sudden incapacitation, which is not consistent with the airplane's coordinated flight profile.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The airplane's encounter with a strong tailwind and/or windshear, which resulted in an inadvertent stall. Contributing to the accident was the pilot's continuation of the unstable approach, long landing, and delayed decision to conduct a go-around.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	(general) - Not attained/maintained
Environmental issues	Tailwind - Effect on operation
Environmental issues	Windshear - Effect on operation
Personnel issues	Decision making/judgment - Pilot
Personnel issues	(general) - Pilot
Aircraft	Airspeed - Not attained/maintained
Aircraft	Descent/approach/glide path - Not attained/maintained
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Takeoff	Windshear or thunderstorm
Takeoff	Aerodynamic stall/spin (Defining event)

On May 23, 2014, at 1553 mountain daylight time, a Raytheon G36 airplane, N536G, impacted terrain near Silver City, New Mexico. The private pilot and three passengers were fatally injured. The airplane was destroyed. The airplane was registered to Rural Health Outreach Inc. and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight that operated without a flight plan. The local flight originated from the Whiskey Creek Airport (94E), Silver City, New Mexico, at 1536.

Several witnesses at 94E saw the airplane just prior to the accident. One witness at 94E saw the airplane in the pattern for runway 35. He noted that the airplane's position on downwind was "tight" in relation to the airport. The airplane began a "very tight base leg that was at least a 60 degree bank." The witness described the winds as gusty, around 25-30 knots, as would be associated with the passage of a thunderstorm. The airplane tightened the base to final turn and overshot the final approach leg. The witness estimated that the airplane's first touchdown occurred near mid-field, where it bounced and then settled to the runway. Shortly thereafter, the engine sounded as if the pilot had applied full engine power. The airplane was seen travelling down the runway and then took off. The airplane's landing gear and flaps appeared to both be down. The airplane began gaining altitude and started a slight right turn. The witness said that the airplane stalled and descended out of sight.

Another witness observed the airplane in a "tight left downwind approach for runway 35 at about 600-800" feet above ground level. The airplane's groundspeed increased in the base turn and the airplane flew through the runway's extended centerline. The airplane used at least 60 degrees of bank to correct back towards the runway's centerline. The airplane landed and then attempted to go around. The airplane went off the end of the runway at a high angle of attack, descended slightly into the valley, and then began to gain altitude. The airplane started a 15° bank turn to the east, began to descend, and the airplane's angle of attack got "steeper" as the airplane descended out of sight.

A witness near the accident site saw the airplane "gradually roll to the right, and then "sharply pitch" to the right where it impacted the ground."

The airplane impacted desert terrain near several trailer homes. A post impact fire ensued and consumed a majority of the airplane.

Pilot Information

Certificate:	Private	**Age:**	67
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	January 29, 2014
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	December 16, 2012
Flight Time:	3600 hours (Total, all aircraft)		

The pilot, age 67, held a private pilot certificate with ratings for airplane single engine land and instrument airplane. The pilot flew his airplane frequently to treat patients at remote medical clinics. A review of the pilot's log book found that the last completed page ended on March 14, 2014. As of that date, the pilot logged a total of 3,547.7 hours. The preceding log book entries indicated that the pilot flew on average 15 hours per month, so the pilot's total flight time was about 3,600 hours prior to the accident. The pilot's flight review, which included an instrument proficiency check, was completed on December 16, 2012, in the accident airplane. On January 29, 2014, the pilot was issued a second class medical certificate with the restrictions that the pilot must wear corrective lenses for near and distant vision. The medical examination also noted mild cataracts and his retina showed no holes, tears, or retinal detachment.

Aircraft and Owner/Operator Information

Aircraft Make:	RAYTHEON AIRCRAFT COMPANY	**Registration:**	N536G
Model/Series:	G36	**Aircraft Category:**	Airplane
Year of Manufacture:	2006	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	E-3707
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	June 6, 2013 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1105.8 Hrs as of last inspection	**Engine Manufacturer:**	TELEDYNE CONTINENTAL
ELT:	Installed, not activated	**Engine Model/Series:**	IO-550-B
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The single engine, low wing, six-seat, retractable gear airplane, serial number E-3707, was manufactured in 2006. It was powered by a single 300-horsepower Continental Motors IO-550-B engine, serial number 675766, that drove a metal Hartzell three bladed, variable pitch propeller. The airplane's last inspection was an annual type accomplished on June 6, 2013, at an airframe total time of 1,105.8 hours. On October 3, 2013, the engine was overhauled and modified by a supplemental type certificate. The overhauled engine was installed in the airplane on November 1, 2013 at a total airframe time of 1,156.1 hours. The most recent hour meter recorded in the logbooks was for maintenance performed on April 8, 2014, at a total airframe time of 1,229.4 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSVC,5446 ft msl	**Distance from Accident Site:**	9 Nautical Miles
Observation Time:	15:55 Local	**Direction from Accident Site:**	168°
Lowest Cloud Condition:	10000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 10000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	21 knots / 28 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	21°C / 1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Silver City, NM (94E)	**Type of Flight Plan Filed:**	None
Destination:	Silver City, NM (94E)	**Type of Clearance:**	None
Departure Time:	15:36 Local	**Type of Airspace:**	

At 1555, an automated weather reporting station located at the Grant Country Airport (KSVC), located about 8.75 nautical miles southeast of the accident site reported wind from 270 degrees at 21 knots gusting to 28 knots, visibility 10 miles, ceiling broken at 10,000 feet, temperature 70 degrees Fahrenheit (F), dew point 34 degrees F, and a barometric pressure of 30.04 inches of mercury.

A weather study was conducted for the accident area. Atmosphere data retrieved from a weather balloon launch at 1800 from Santa Teresa, New Mexico, identified an environment conducive to "dry microbursts." This area had a potential for severe weather gusts of 68 knots and microburst gust potential of 50 knots. Weather radar data identified patterns consistent with developing and decaying convective activity in the vicinity of the accident site near the time of the accident. Some storm cell decay occurred south of the accident location with 10-15 minutes prior to the accident. In addition, from 1539-1555, several lightning strikes were detected within 10 miles of the accident site.

Airport Information

Airport:	WHISKEY CREEK 93E	**Runway Surface Type:**	Asphalt
Airport Elevation:	6126 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	35	**IFR Approach:**	None
Runway Length/Width:	5400 ft / 50 ft	**VFR Approach/Landing:**	Traffic pattern

The Whiskey Creek Airport (94E) is a public airport located at measured altitude of 6,126 feet mean sea level. It has one runway 17/35, 5,400 feet by 50 feet, of asphalt construction in good condition.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	32.778331,-108.202224

The airplane impacted desert terrain near several trailer homes, about 0.8 miles northeast of runway 35's departure end. The airplane's first impact point was a transmission wire located west of the accident site about 25 feet above the ground. Forty feet east of the transmission wire was a ground crater which contained the airplane's propeller. The debris path was roughly cone shaped, was aligned on a 77° magnetic heading, and was about 140 feet long and 70 feet at its widest area. A postimpact fire ensued which consumed a majority of the airplane. The main wreckage contained remnants of the cabin, fuselage, wings, and empennage. The wreckage came to rest facing a 228° heading.

Both ailerons were partially consumed by the postimpact fire and remnants remained attached to their respective wing. The left aileron trim actuator extension was measured and found to be about 1.75 inches, which corresponded to about 7° trim tab trailing edge down. Aileron control continuity was established from the flight controls to each wing bell crank. Aileron trim control cable continuity was confirmed from the cockpit to the aileron trim actuator. The flaps actuator indicated the flaps were up. The left and right elevator flight control surfaces were partially consumed by the postimpact fire. Remnants of the elevators remained attached to their respective horizontal stabilizer. The left and right elevator trim actuator extensions were measured and found to be 1.625 inches, which corresponded between 10-15° trim tab trailing edge down, airplane nose up. Elevator control continuity was confirmed from the cockpit to the elevator surfaces. The elevator trim control cables were confirmed from the cockpit to the trim actuators. The rudder was partially consumed by the postimpact fire and remnants remained attached to the vertical stabilizer. Rudder control continuity was established from the cockpit to the rudder bell crank. The gear handle was found in the down position. The fuel selector was found selecting the right main tank. No preimpact anomalies were detected with the airframe.

The engine was impacted damaged and found separated from the airframe. Both magnetos were actuated by hand and found to produce a spark at each terminal. The fuel manifold valve screen was clear of debris and all fuel nozzles were found clear of blockages. The throttle body and fuel metering unit's fuel screen contained a small amount of fibrous material but was largely unobstructed. The crankshaft was able to be turned by hand with continuity established throughout the engine. Cylinder thumb compression and suction was confirmed to each cylinder. A borescope inspection of each cylinder found normal operation and combustion signatures. No preimpact anomalies were detected with the engine.

The propeller blades were labelled "A", "B", and "C" for documentation purposes only. All three blades displayed signatures of chordwise scratches, leading edge nicks and gouges, and blade polishing. Blade B was curled near the tip and the tip of the blade was found separated. Blade C displayed S-bending along its entire length.

A Garmin Oregon 450t hand held GPS was found in the debris field and was sent to the NTSB

laboratories for a data download.

Medical and Pathological Information

An autopsy was authorized and conducted on the pilot by the New Mexico Office of the Medical Investigator. The cause of death was the result of multiple blunt trauma and the manner of death was ruled an accident. The autopsy identified 80% stenosis of the distal third left anterior descending coronary artery. All other arteries were free of stenosis.

Forensic toxicology was performed on specimens from the pilot by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. Testing detected the presence of oxymetazonline which is a decongestant used in the treatment of nasal congestion.

Tests and Research

Pilot Operating Handbook

Beechcraft's Model G36 Bonanza Pilot's Operating Handbook (POH), revised July 2014, listed the maximum demonstrated crosswind limit as 17 knots.

The Normal Procedures section lists the balked landing checklist:

1. Throttle and Propeller … Full Forward
2. Airspeed …80 KTS (until clear of obstacles, then trim to 110 KTS)
3. Flaps … UP
4. Landing Gear … RETRACT
5. Cowl Flaps … OPEN

Published landing performance data for the airplane is predicated on a threshold speed between 78-81 knots depending on the airplane's weight. Published performance data does not exist for landings in excess of the published approach speeds or in excess of 10 knots of tailwind. Using a gross weight of 3,400 pounds, a direct crosswind of 20 knots, 70° F, and an approach speed of 80 knots, engineers from Textron Aviation estimated the required landing distance at 1,720 feet.

The POH provided a chart of stall speeds with idle power. The chart was run for the airplane's final configuration of flaps up and airplane gross weights between 2,800-3,600 pounds. The stall speed at 30° of bank would be between 66-72 knots.

Additional Information

Garmin Oregon 450t

The Garmin Oregon 450t is a battery operated hand-portable GPS receiver with a 12 channel wide area augmentation system (WAAS). The unit contains an electronic compass and a barometric pressure sensor for recording pressure-based altitude information. Published GPS position location accuracy is less than 33 feet horizontal under normal conditions, and 10-16 feet with differential global positioning system (DGPS) active. Although the device was thermally damaged, the airplane's last flight track was extracted. For the accident flight, the device was powered on at 1401 and recorded the airplane's takeoff time of 1536 as the flight departed on runway 17. The airplane turned to the north and flew about 13 miles north in an area between Black Peak and New Mexico Highway 15. The airplane then returned back to 94E and entered a left base turn for runway 35. Starting at 1551, the GPS update rate began to vary and there were two episodes of where the GPS receiver momentarily lost satellite lock and continued to record position information based on projected data. About 1552:15, as the airplane turned left towards the runway, the receiver lost satellite lock and the airplane's position returned at 1552:42 as the airplane was over the runway. At that time, the airplane was about 770 feet down the runway and 175 feet above ground level. At 1552:53, the airplane touched down with a groundspeed of 120 knots, skipped, and touched down 3 seconds later at 100 knots groundspeed with about 1,810 feet remaining on the runway. The airplane slowed to 87 knots and with 1,060 feet remaining on the runway the airplane's groundspeed began to increase. The airplane lifted off from the runway, flew to the north, and began a slight climb. At 1553:12, the airplane began to turn right at a rate of about 3-4° per second. About 1553:26, the receiver again lost satellite lock and regained the airplane's position about 30 seconds later at the accident site. The final portion of the accident sequence was not captured by the device.

iPhone

An Apple iPhone was located in the airplane's wreckage and shipped to the NTSB laboratories for download. Data extracted from the iPhone showed that none of the video files were date/time stamped on the day of the accident. Thirty eight of the image files were date/time stamped on the day of the accident. Most of these files depicted persons and aircraft on the ground. Ten of these files corresponded with previews or full resolution images of the view off the right wing from inside an aircraft in-flight. The file containing the most recent image was taken at 15:46:35 MDT. There was no data which could aid in reconstructing in accident sequence.

Secure Digital (SD) Card

An SD card was found in a thermally damaged camera in the airplane's wreckage. The SD card was extracted from the camera and shipped to the NTSB laboratories for download. Data extracted from the SD card found that two of the video files were date/time stamped on the day of the accident. Twenty of the image files were date/time stamped on the day of the accident. All of the image files corresponded with external views of an airplane on the ground or in-flight views looking forward or off the right wing. The most recent image was time stamped 1546 MDT. The two video files depicted in-flight views looking forward or off the right wing from an airplane in level flight. There was no data which could aid in reconstructing in accident sequence.

Administrative Information

Investigator In Charge (IIC):	Aguilera, Jason
Additional Participating Persons:	Ken Hand; FAA; Albuquerque, NM Kurt Gibson; Continental Motors; Mobile, AL Ernie Hall; Textron Aviation; Wichita, KS
Original Publish Date:	September 17, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89260