# Aviation Investigation Final Report

| | | | |
|---|---|---|---|
| **Location:** | St  George, Utah | **Accident Number:** | WPR09FA320 |
| **Date & Time:** | June 30, 2009, 07:08 Local | **Registration:** | N927GL |
| **Aircraft:** | PIPER AIRCRAFT INC PA-46-350P | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Controlled flight into terr/obj (CFIT) | **Injuries:** | 1 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

Radar data indicated that the airplane departed for a cross-country flight, climbed to a cruise altitude of 9,700 feet msl, and maintained a northeasterly course of 050 degrees magnetic direct to its destination. About 11 minutes after takeoff, the airplane entered a 1,000 foot-per-minute descent. The airplane continued to descend at this rate until it impacted terrain at an elevation of 4,734 feet. Examination of the accident site revealed that the airplane was still on its northeasterly course towards the destination at impact. Ground scars at the initial point of impact were consistent with the airplane being wings level in a slight nose-down pitch attitude. No mechanical anomalies with the airplane or engine were identified during the airplane wreckage examination. A postimpact fire destroyed all cockpit instrumentation, and no recorded or stored flight data could be recovered. Weather conditions at the time were clear, and light winds. The pilot had some moderate heart disease that was noted during the autopsy. He also had a history of stress and insomnia, which was documented in his FAA medical records. Toxicology findings noted the use of a sedating and impairing over-the-counter medication (chlorpheniramine) that was taken at some undetermined time prior to the accident. The investigation could not conclusively determine whether the pilot's conditions or medication use were related to the accident. The reason for the airplane's descent to ground impact could not be determined.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain terrain clearance during descent for undetermined reasons.

## Findings

| | |
|---|---|
| **Aircraft** | Altitude - Not attained/maintained |
| **Environmental issues** | Mountainous/hilly terrain - Not specified |

# Factual Information

## History of Flight

| | |
|---|---|
| **Enroute-descent** | Controlled flight into terr/obj (CFIT) (Defining event) |

HISTORY OF FLIGHT

On June 30, 2009, at 0708 mountain daylight time, a Piper PA-46-350P, N927GL, collided with mountainous terrain 16.3 miles west of St. George, Utah. The airplane was operated by the private pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The pilot was killed and the airplane was substantially damaged. Visual meteorological conditions prevailed, and a VFR (visual flight rules) flight plan had been filed. The flight originated at North Las Vegas Airport, Las Vegas, Nevada, at 0651, and the intended destination was Cedar City, Utah.

Radar data indicated that the airplane departed North Las Vegas and climbed to an altitude of 9,700 feet mean sea level (msl) on a northeasterly course of 050 degrees magnetic. At 0656, the pilot checked in with Los Angeles Center, stating he was at 9,200 feet VFR to Cedar City. At 0702, the data showed the target entering an approximately 1,000-foot-per-minute (fpm) rate of descent. The target continued to descend at this rate until radar contact was lost. The last radar return was at 0707, at an altitude of 5,400 feet msl, 5.5 miles southwest of the accident location. The course of the target was along a northeasterly line of 050 degrees, consistent with a direct course to Cedar City. There were no other radio communications with the pilot by Los Angeles Center other than the initial check in.

The airplane wreckage was located by the Civil Air Patrol and Washington County Search and Rescue in the late afternoon of June 30. The initial impact point was just below the crest of a small hill at 4,734 feet msl, and the main wreckage was located on a 30-degree slope of a large hill, approximately 384 feet northeast of the initial impact point. The bearing from the initial impact point to the main wreckage was 054 degrees (northeast direction). Cedar City lays on a 049 degree bearing and is 60 miles from the accident site.

PERSONNEL INFORMATION

The pilot, age 54, held a private pilot certificate for airplane single-engine land, and an airplane instrument rating, issued on September 14, 2006. A second-class medical certificate was issued on October 24, 2007, with the restriction that he have glasses available for near vision.

The family provided a copy of the pilot's flight logbook. The last entry in the logbook was dated September 18, 2008, with a recorded total flight time of 782.7 hours. The son of the pilot stated that his father stopped logging flight time in his pilot log, and started using an

electronic log that was available in the airplane. On November 27 and 28, 2007, the logbook recorded two flights where the pilot practiced instrument procedures with a certified flight instructor (CFI), and logged 12 instrument approaches.

The pilot's wife stated that they had spent the weekend in Arizona visiting their son, and returned to Las Vegas Monday night, June 29. The pilot had a normal night's sleep of 6 hours and was up around 0500 Tuesday morning. He walked the dogs and decided to fly to Cedar City. He most likely did not eat breakfast, which was consistent with his normal morning routine. He was in the process of selling the airplane and this would have been his last flight in it before he turned it over to the buyer. He was considering purchasing a smaller airplane for his future use. She said that he was healthy and fit with no serious health concerns. He did take medication for high cholesterol, and she thought he had hypoglycemia, but a doctor had never diagnosed him with that condition. He sometimes would experience tiredness, low energy, or weakness, but he never lost consciousness. He normally carried a soda pop or candy bar that he could eat if he felt those symptoms. She also stated that he was not under any unusual emotional stress, and there had been no change in their financial situation.

## AIRCRAFT INFORMATION

The six seat, low-wing, retractable landing gear, single engine airplane, serial number (S/N) 4636400, was manufactured in 2006. It was powered by a Lycoming TIO-540-AE2A, 350-hp engine and equipped with a Hartzell, 3-bladed constant speed propeller, model HC-I3YR-1E. A review of copies of the maintenance logbooks showed an annual inspection was completed on March 6, 2009, at a recorded Hobbs meter reading of 306.4 hours, total airframe hours of 306.4, and engine total time since new of 306.4 hours. The records showed that the primary flight display (PFD) was removed, rebuilt and reinstalled on May 29, 2008; the multifunction display (MFD) was removed and replaced on October 26, 2008; and the copilot's PFD was removed and replaced on June 17, 2009. The son of the pilot related that the airplane had a history of electrical problems with the PFDs, MFDs, autopilot, and pitot system.

Fueling records from the North Las Vegas Terminal document that the airplane was last fueled on June 30, 2009, at 0622, with 47.7 gallons of 100LL avgas.

The pilot operating handbook (POH) describes the flight control system as follows, "The primary flight controls are conventional and are operated by dual control wheels and rudder pedals. The control wheel operates the ailerons and elevator. The rudder pedals actuate the rudder and nose wheel steering. The toe brakes, which are an integral part of the pedals, operate the wheel brakes. The ailerons and rudder are interconnected through a spring system, which is activated only when controls are out of harmony. In normal coordinated flight, the system is inactive. All flight control systems are operated by closed circuit cable systems."

The autopilot was an S-TEC 55X two-axis automatic flight guidance system with trim monitor. The autopilot was integrated with the Avidyne PFD and MFD, and the Garmin GNS430W GPS (global positioning system) systems. The S-TEC 55X pilot operating handbook (POH) states

the following regarding the Vertical Speed Mode capability. “The vertical speed mode can only be engaged if a roll mode (HDG, NAV, NAV APR, REV, REV APR, NAV GPSS) is already engaged. With a roll mode engaged and the aircraft at the desired vertical speed, press the VS mode selector switch to engage the vertical speed mode. The VS annunciation will appear…to acknowledge that this mode is engaged, along with the current vertical speed. The latter appears as a number in units of FPM x 100, prefixed by either a "+" to indicate a climb, or a "-" to indicate a descent (i.e., for example, +5 indicates 500 FPM climbing, if within the aircraft's capabilities). The autopilot will hold the aircraft at its current (captured) vertical speed. This vertical speed may be modified by rotating the Modifier Knob. In a climb, rotating the Modifier Knob clockwise (CW) increases the climb rate, whereas rotating it counterclockwise (CCW) decreases the climb rate. In a descent, rotating the Modifier Knob CCW increases the descent rate, whereas rotating it CW decreases the descent rate. Each detent equals 100 FPM, and the range is ±1600 FPM from the original captured vertical speed.” The autopilot can be disconnected by pressing the remote autopilot disconnect switch on the control wheel, or pressing either forward or aft on both segments of the remote manual electric trim switch on the control wheel, or setting the autopilot master switch to the OFF position, or by pulling the autopilot circuit breaker.

The MFD had a Terrain Awareness and Warning System (TAWS) Mode, which is normally ‘on’ and can be ‘inhibited’ by the pilot. If the pilot engages the ‘TERR INHIB’ button, all terrain alerting functions are inhibited. The TAWS provides the following visual warnings on the Terrain Awareness Control Unit: red annunciator light for terrain warnings, amber annunciator light for terrain cautions, and white annunciator light for terrain inhibit. The TAWS also provides aural warnings and advisory call outs. The advisory call out “Five Hundred” occurs at 500 feet above ground level (agl), and “Caution Terrain” or “Caution Obstacle” is also announced when parameters are met. The TAWS provides “Terrain, Terrain, Pull Up” or “Obstacle, Obstacle, Pull Up” warnings. These warnings are also accompanied by a visual pop up message on the active MFD page.

## METEROLOGICAL INFORMATION

St. George Airport is 16.3 nm east of the accident location. St. George Airport’s automated weather observation system (AWOS) recorded on June 30, at 0715 PDT, that the sky was clear, visibility was 10 miles, and winds were 070 degrees at 3 knots.

McCarran International Airport (KLAS), Las Vegas, recorded weather observation for 0655 PDT as calm winds, 10 statute miles visibility, clouds few at 11,000 feet, and overcast at 20,000 feet.

## COMMUNICATIONS

Shortly after departing North Las Vegas the pilot contacted Los Angeles Center at 0656, and stated that he was at 9,200 (ft msl), VFR (visual flight rules) to Cedar City. Los Angeles Center acknowledged his altitude, and transmitted the current Las Vegas altimeter setting. The pilot

copied the altimeter setting. At 0711, Los Angeles Center called N927GL, stated that radar contact had been lost, and asked the pilot to say his altitude. Los Angeles Center never received a response from the N927GL. No further communications with the accident pilot were established by Los Angeles Center.

WRECKAGE AND IMPACT INFORMATION

All bearings and distances related to airplane component location were derived from GPS coordinates recorded at the accident site and transposed on to a topographical mapping computer program (TopoUSA). The accident site was located on the lower southwest skirt of a 6,100-foot (msl) peak.

The initial impact point was located on the southwestern slope of a small hill about 78 feet below the crest. The elevation of the hill as measured by GPS was 4,734 feet msl. The hill consisted of arid sand and rock, populated by sparse scrub brush. The initial ground scar was 14 feet long, 6 feet wide, and 2 feet deep, oriented on a bearing of 054 degrees magnetic. A 15-foot-long narrow ground scar originating at the main disturbed area of ground extended to the left, and a similar ground scar extended 21 feet to the right. Small red glass fragments were located in the vicinity of the northwest end of the left ground scar. A propeller tip, approximately 12 inches in length, was located at the initial impact point. The tip had leading edge and chordwise scratches on both sides. An area of discolored/darkened earth and burned vegetation extended in a cone fashion from the initial impact point to the top of the hill, measuring 78 feet in length and 100 feet in width (at the hill crest).

The main wreckage was located against a large 30-degree sloped hill, at the 4,734-foot (msl) elevation, 384 feet from the crest of the initial impact hill on a bearing of 054 degrees. The cockpit and cabin of the airplane had been consumed by fire. The wreckage was inverted, the left wing was to the south, and the right wing was on the north side. The right aileron had separated from the wing and was located 172 feet to the south-southeast. The wreckage was orientated on a bearing of 093 degrees from tail to nose. The tail laid inverted with the vertical stabilizer and rudder directed down into the ground, and resting on the right horizontal stabilizer. Flight control continuity was established through multiple control cable overload separations, from the control sectors to the cockpit. The elevator trim drum was extended 7 threads to the aft, which, according to the manufacturer, corresponded to the neutral position. The post impact fire destroyed the cockpit PFDs and MFDs, and no recorded or stored flight data could be recovered from these instruments.

The engine, a TIO-540-AE2A, had been displaced from the engine mount and was located 40 feet uphill on a 012 bearing from the main wreckage. The lower spark plugs were removed; five were light gray color, one was oil soaked, all exhibited no mechanical damage, and corresponded to normal wear per the Champion Aviation Check-A-Plug chart. The engine was hand rotated using the accessory drive, achieving thumb compression on all 6 cylinders. Both magnetos were located uphill above the engine, were mechanically fragmented, and could not be rotated by hand. Turbo charger impellers exhibited damage consistent with rotation and no

evidence of foreign object ingestion.

Propeller blades had been cleanly severed from the blade butts. Blade butts remained in the propeller hub sockets.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on July 1, 2009, by the State of Utah Medical Examiner. The autopsy findings concluded the immediate cause of death was “Blunt force impact injuries and conflagration injuries due to plane crash.” Other significant conditions include “Coronary artery disease.” The autopsy report noted that the heart weighed 270 grams, indicated that the chambers of the pilot’s heart “appear dilated,” and identified “up to 80% occlusion” of one coronary artery. No blood was available to test for carbon monoxide. There were no indications on autopsy of any other pre-existing disease.

Forensic toxicology was performed on specimens obtained during the autopsy by the Federal Aviation Administration Forensic Toxicology Research Team CAMI, Oklahoma City, Oklahoma. The toxicology report stated that the tests for carbon monoxide and cyanide were not performed, no ethanol was detected in muscle or brain, chlorpheniramine was detected in the liver, chlorpheniramine was detected in the kidney, and quinine was detected in the liver. Chlorpheniramine is an over-the-counter sedating antihistamine commonly used for cold and allergy symptoms. Quinine is found in tonic water or as an over-the-counter nutritional supplement.

The pilot’s most recent application for a second-class FAA medical certificate dated 10/24/2007 noted the use of two prescription medications: escitalopram, a prescription antidepressant, and atorvastatin, a cholesterol lowering medication. Issuance of the medical certificate was deferred by the pilot’s aviation medical examiner. The pilot subsequently submitted documentation to the FAA that the escitalopram was used to treat stress and insomnia, not depression, and that the medication was discontinued when the pilot became aware that the medication was not permitted for use by pilots.

The FAA issued a second-class medical certificate to the pilot on 2/26/2008. A medical history form from the pilot’s primary care physician dated 5/18/2009 noted only ezetimibe/simvastatin, a combination prescription cholesterol lowering medication, as a current medication.

## Pilot Information

| | | | |
|---|---|---|---|
| **Certificate:** | Private | **Age:** | 54,Male |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Unknown |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 2 With waivers/limitations | **Last FAA Medical Exam:** | October 31, 2007 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | November 28, 2007 |
| **Flight Time:** | 782 hours (Total, all aircraft) | | |

## Aircraft and Owner/Operator Information

| | | | |
|---|---|---|---|
| **Aircraft Make:** | PIPER AIRCRAFT INC | **Registration:** | N927GL |
| **Model/Series:** | PA-46-350P | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 4636400 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 6 |
| **Date/Type of Last Inspection:** | March 10, 2009 Annual | **Certified Max Gross Wt.:** | 4358 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 1 |
| **Airframe Total Time:** | 304 Hrs as of last inspection | **Engine Manufacturer:** | |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | |
| **Registered Owner:** | On file | **Rated Power:** | |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

| | | | |
|---|---|---|---|
| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | KSGU,2941 ft msl | **Distance from Accident Site:** | 163 Nautical Miles |
| **Observation Time:** | 07:15 Local | **Direction from Accident Site:** | 87° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 3 knots / None | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 70° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29.87 inches Hg | **Temperature/Dew Point:** | 27°C / 1°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | North Las Vegas, NV (KVGT) | **Type of Flight Plan Filed:** | VFR |
| **Destination:** | Cedar City, UT (KCDC) | **Type of Clearance:** | VFR |
| **Departure Time:** | 06:51 Local | **Type of Airspace:** | |

## Airport Information

| | | | |
|---|---|---|---|
| **Airport:** | North Las Vegas KVGT | **Runway Surface Type:** | |
| **Airport Elevation:** | 2205 ft msl | **Runway Surface Condition:** | |
| **Runway Used:** | | **IFR Approach:** | |
| **Runway Length/Width:** | | **VFR Approach/Landing:** | |

## Wreckage and Impact Information

| | | | |
|---|---|---|---|
| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | | **Aircraft Fire:** | On-ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 Fatal | **Latitude, Longitude:** | 37.141944,-113.933334 |

## Administrative Information

| | |
|---|---|
| **Investigator In Charge (IIC):** | McKenny, Van |
| **Additional Participating Persons:** | Wesley Dollahite; Federal Aviation Administration; Salt Lake City, UT<br>Mark Platt; Lycoming; Van Nuys, CA<br>Michael C McClure; Piper Aircraft Incorporated; Dallas, TX |
| **Original Publish Date:** | May 11, 2010 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=74173 |