Aviation Investigation Final Report

Location:	Milner, Colorado	**Accident Number:**	CEN12FA571
Date & Time:	August 24, 2012, 14:45 Local	**Registration:**	N7774P
Aircraft:	Piper PA-24-250	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The student pilot departed on a cross-country flight and was not in contact with air traffic controllers; no flight plan had been filed. Log data recovered from the handheld global positioning system (GPS) unit depicted a flight track consistent with the accident flight and logged a maximum speed of 135 knots and a maximum GPS altitude of 18,379 feet. The airplane's wreckage was located in a remote valley the following afternoon. An examination of the engine and airframe revealed no anomalies. Damage to the airplane and ground scars were consistent with the airplane being in a stall and flat spin at the time of impact. During the examination of the wreckage, marijuana and an opened six-pack of beer were found; the beer bottles were located in the front of the airplane, within the pilot's reach. Toxicological testing found both alcohol and marijuana in the pilot's system. The amount of alcohol in the pilot's system would have significantly impaired the pilot's performance. In addition, the amount of marijuana and its metabolite found in the pilot's system indicated he was actively smoking in the hour before the accident; this would also have significantly impaired his ability to control the airplane. Both of these intoxicants may have impaired his judgment and contributed to the pilot's decision to fly above 18,000 feet in an aircraft not equipped with oxygen. The resulting hypoxia also impaired his ability to control the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The student pilot's impairment from alcohol, marijuana, and hypoxia, which adversely affected his ability to maintain control of the airplane.

Findings

Personnel issues	Alcohol - Pilot
Personnel issues	Illicit drug - Pilot
Personnel issues	Aircraft control - Pilot
Personnel issues	Hypoxia/anoxia - Pilot
Aircraft	(general) - Not attained/maintained

Factual Information

History of Flight

Enroute	Loss of control in flight (Defining event)

On August 24, 2012, about 1445, a Piper PA-24-250, N7774P, was substantially damaged when it impacted terrain northwest of Milner, Colorado. The student pilot was fatally injured. The aircraft was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which was being operated without a flight plan. The flight originated from Glenwood Springs Municipal Airport (KGWS), Glenwood Springs, Colorado at 1359.

According to the Routt County Sheriff's Office, a sheepherder found the wreckage around 1000 on August 25, 2012. The airplane was not in contact with air traffic control. According to a family member, the airplane departed Glenwood Springs, Colorado, and was en route to Minnesota. The airplane was not reported missing by friends or family, and an Alert Notification for a missing airplane had not been filed.

Radar data, provided by Denver Center in en route radar intelligence tool (ERIT) format, depicted a flight path consistent with that of the accident airplane. The transponder in the airplane was off so the radar data did not depict the altitude of the flight.

Pilot Information

Certificate:	Student	**Age:**	36,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	March 1, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

The pilot, age 36, held a student pilot certificate issued on March 21, 2011. He was issued a third class airman medical certificate without limitations on March 21, 2011. At the time of application, the pilot reported that he had logged zero hours of flight time.

A personal logbook reflecting the flight experience of the pilot or instructor endorsements was not located.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N7774P
Model/Series:	PA-24-250	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-2990
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	March 11, 2012 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	68 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	7370 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	O-540-A1-D5
Registered Owner:	On file	**Rated Power:**	250 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The accident airplane, a Piper PA-24-250 (serial number 24-2990), was manufactured in 1962. It was registered with the Federal Aviation Administration (FAA) on a standard airworthiness certificate for normal operations. A Lycoming O-540-A1-D5 engine rated at 250 horsepower at 2,575 rpm powered the airplane. The engine was equipped with a metal, 3-blade, McCauley propeller.

The airplane was registered to and operated by a private individual, and was maintained under an annual inspection program. A review of the maintenance records indicated that an annual inspection had been completed on March 1, 2012, at an airframe total time of 7,303 hours. The airplane had flown 67 hours between the last inspection and the accident, and had a total airframe time of 7,370 hours. The airplane was not equipped with a supplemental oxygen system or a portable bottle.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSBS,6882 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	14:53 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Scattered / 2100 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 12000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / 15 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	40°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.07 inches Hg	**Temperature/Dew Point:**	18°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Glenwood Spring, CO (KGWS)	**Type of Flight Plan Filed:**	None
Destination:	Saint Paul, MN	**Type of Clearance:**	None
Departure Time:	13:59 Local	**Type of Airspace:**	

The closest official weather observation station was Steamboat Springs Airport/Bob Adams Field (KSBS), Steamboat Springs, Colorado, located 8 nautical miles (nm) east of the accident site. The elevation of the weather observation station was 6,882 feet above mean seal level (msl). The routine aviation weather report (METAR) for KSBS, issued at 1453, reported, wind 040 degrees at 10 knots, gusting to 15 knots, visibility 10 miles, sky condition, scattered clouds at 2,100 feet, broken clouds at 12,000 feet, temperature 18 degrees Celsius (C), dew point temperature 4 degrees C, altimeter 30.08 inches.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	40.5125,-107.033889

The wreckage came to rest upright on a heading of 010 degrees in the bowl of a valley, surrounded by deciduous and coniferous trees and bushes, at a measured elevation of 7,070 feet msl. The main wreckage included the engine and propeller assembly, the fuselage, empennage, and the right and left wings. Paint chips, plexiglass, and small components surrounded the main wreckage. One ground scar, approximately 8 inches in depth, was located just forward of the engine. There were no other ground

scars or points of impact noted.

The engine remained attached to the fuselage. The upper two engine mounts were bent, broken, and pushed aft, and the engine cowling was bent and crushed up and aft around the engine. The propeller remained attached to the engine at the propeller flange. The propeller blades were labeled "A", "B", and "C" for identification purposes in the report. Blade "A" was unremarkable. Blade "B" exhibited leading edge polishing, and was otherwise unremarkable. Blade "C" was bent aft 45 to 55 degrees under the engine. Blade "C" exhibited leading edge polishing but was otherwise unremarkable. The spinner on the engine was crushed aft.

The left wing included the left aileron and left flap and remained attached to the fuselage. The entire leading edge of the left wing was crushed up and aft in an accordion manner. Paint along the entire leading edge separated from the airplane. The main and auxiliary left wing fuel tanks were crushed down and the fuel bladders torn open. No fuel was present in either tank. The left aileron remained attached to the left wing and was impact damaged. Bending and wrinkling of the wreckage prevented full manipulation of the left aileron; however, both the primary and balance cables were continuous. The left flap remained attached, was impact damaged, and appeared to be extended several degrees.

The fuselage on the left side of the airplane, between the left wing and the empennage was buckled in several locations. The fuselage between the empennage and the right wing was unremarkable.

The empennage included the stabilator, rudder, and vertical stabilizer, and remained attached to the empennage. The left side of the stabilator was wrinkled along the entire control surface. The right side of the stabilator was wrinkled along the outboard trailing edge of the control surface. The vertical stabilizer was unremarkable. The upper portion of the rudder control was bent to the left. Bending and wrinkling of the wreckage prevented full manipulation of the rudder and stabilator; however, both the stabilator and rudder control cables were continuous.

The right wing included the right aileron and the right flap, and remained attached to the fuselage. The entire leading edge of the right wing was crushed up and aft in an accordion manner, with the extent of crushing decreasing in intensity toward the tip of the wing. Paint along the entire leading edge separated from the airplane. The main and auxiliary right wing fuel tanks were crushed down and the fuel bladders torn open. No fuel was present in either tank. The right aileron remained attached to the right wing and was impact damaged. Bending and wrinkling of the wreckage prevented full manipulation of the right aileron; however, both the primary and balance cables were continuous. The right flap remained attached, was impact damaged, and appeared to be extended by several degrees.

The fuselage included the forward and aft cabin, and the instrument panel. The front two seats remained in the seat track and were crushed down. The rear seat was crushed down and the floor of the airplane was crushed up. The forward portion of the fuselage, including the floor and the instrument panel was crushed up and aft. The upper portion of the fuselage was bent and wrinkled and the plexiglass windscreen separated and was fragmented. The roof of the cabin had been bent aft for the purpose of extracting the pilot. An auger, a chain saw, a backpack full of personal effects, a basket of clothing, food, six beer bottles, marijuana, and various other personal effects were located throughout the cabin. The beers bottles were in a cardboard container with a six pack configuration located in the front seat of the airplane and were broken.

The fuel selector valve was in the right auxiliary position.

Flight recorders

A Garmin GPSMAP 696 portable multi-function display and global positioning system receiver was found in the wreckage. The unit was sent to the National Transportation Safety Board (NTSB) Vehicle Recorders Lab in Washington, D.C., for data recovery. The unit was capable of recording flight track history when configured to do so. The unit was repaired and recorded waypoint, route, and tracklog data was successfully downloaded. The unit had been configured not to record tracklog data; however, flight history from May 24, 2012, through August 24, 2012, was recovered. The last flight log recovered was consistent with the accident flight and logged a maximum ground speed of 135 knots and a maximum GPS altitude of 18,379 feet, though the groundspeed and altitude values could not be validated.

Medical and Pathological Information

An autopsy was performed on the pilot by a Forensic Pathology Consultant as authorized by the Routte County Coroner's office on August 27, 2012. A toxicology screen conducted by the Horizon Lab, LLC, detected amphetamine and cannabinoid in the blood, in addition to 0.110 g/dl of ethanol. The autopsy noted the cause of death as multiple blunt force injuries and listed the specific injuries. It stated that "acute ethanol intoxication may have been a contributing factor in the events which lead up to the accident. Based on comparison of the ethanol levels in the blood with those in the vitreous fluid, it is likely that [the pilot] was consuming ethanol within 1 – 2 hours of the accident. Based on this behavior, suicide cannot be excluded as the manner of death." The manner of death was listed as undetermined.

The FAA's Civil Aerospace Medical Institute, Oklahoma City, Oklahoma, performed toxicological tests on specimens that were collected during the autopsy (CAMI Reference Number 201200176001). A sample of peripheral blood detected 104 mg/dL of ethanol, 0.072 ug/ml Tetrahydrocannabinol (Marihuana), and 0.0174 ug/ml Tetrahydrocannabinol Caroxylic Acid (Marihuana). Amphetamines were not detected in these samples.

Tests and Research

The wreckage was recovered and relocated to a hangar in Greeley, Colorado, for further examination.

There were no shoulder harnesses installed in the accident airplane. Neither of the forward lap belts were latched. The webbing of the buckle end of the left seatbelt was chaffed and the flat end webbing was unremarkable.

Approximately 5 ounces of fuel was recovered from the fuel bowl at the fuel selector valve. The fuel was clean, bright, and blue in color. Small particles were found in the fuel bowl and the fuel bowl screen was free of contamination. Approximately ¼ cup of fuel was recovered from one electric fuel boost pump and a trace amount of fuel was recovered from the other electric fuel boost pump. The filters were free of debris.

The position of the flap transmission assembly was consistent with retracted flaps. The jack screw exposed 8 threads which is also consistent with retracted flaps. Flight control continuity for the rudder and ailerons was confirmed from the center portion of the fuselage forward to the flight control yokes in the cabin.

The engine was removed from the airframe to aid in the examination. Both magnetos exhibited impact damaged and were removed for further examination. When actuated by hand, spark was observed at each lead. The vacuum pump was impact damaged and the shaft of the pump was intact and unremarkable. The engine driven fuel pump was dry and when actuated by hand, air movement/suction was produced.

The top bank of sparkplugs was removed and the leads on the sparkplugs were light in color consistent with a lean fuel mixture. The engine was rotated at the propeller flange. Air and valve movement was noted on all six cylinders. All six cylinders were examined with a boroscope and no anomalies were noted.

The oil pick-up screen, the propeller governor screen, and the carburetor fuel inlet screen were all clear of contaminations. No fuel was noted in the carburetor. The mounting flange was impact damaged and the carburetor was otherwise unremarkable. The throttle cable remained attached to the carburetor. The mixture cable separated from the mixture control arm, consistent with impact damage.

Administrative Information

Investigator In Charge (IIC):	Rodi, Jennifer
Additional Participating Persons:	Brian Neal; FAA Flight Standards District Office; Denver, CO William Watts; FAA Flight Standards District Office; Denver, CO Charles R Little; Piper Aircraft; Chino Hills, CA Troy Helgeson; Lycoming
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