Aviation Investigation Final Report

Location:	Harrisburg, Illinois	**Accident Number:**	CEN15FA347
Date & Time:	August 9, 2015, 20:50 Local	**Registration:**	N9684U
Aircraft:	GRUMMAN AMERICAN AVN. CORP. AA 5A	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The student pilot departed for a cross-country personal flight with one passenger on a moonless night. Meteorological and astrological conditions on the night of the accident included a convective system near the accident site about the time of the accident with no moon illumination. No radar data associated with the accident airplane were identified.

Before reaching the destination airport, the student communicated to his spouse that he was returning to the airport, presumably to his point of departure. The airplane was located the following day in an unlit, heavily wooded area of a national forest. Impact signatures were consistent with the airplane's right wing striking tree tops before the airplane descended and impacted terrain in a nose-low attitude.

A postaccident examination of the airframe and engine did not reveal any preimpact anomalies that would have precluded normal operation. The student's logbook was not recovered, and his total and night flying experience could not be determined. It also could not be determined whether he had received any solo endorsements.

The student should not have taken off in dark, night conditions, and it is likely that, as he entered an area with little to no ambient light and cloudy weather conditions, he had no ground references or natural horizon, which resulted in his subsequent controlled descent into terrain.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The student pilot's improper decision to conduct a flight in dark, night conditions and his subsequent controlled flight into terrain.

Findings

Personnel issues	Decision making/judgment - Student/instructed pilot
Environmental issues	Dark - Effect on personnel
Personnel issues	Total experience - Student/instructed pilot
Aircraft	Altitude - Not attained/maintained

Factual Information

History of Flight

Enroute	Controlled flight into terr/obj (CFIT) (Defining event)

On August 9, 2015, about 2050 central daylight time, a Grumman AA-5A airplane, N9684U, impacted terrain in the Shawnee National Forest near Harrisburg, Illinois. The student pilot and passenger were fatally injured. The airplane was substantially damaged. The airplane was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Dark night visual meteorological conditions prevailed for the route of flight, and no flight plan was filed. The flight originated from the Marion-Crittenden County Airport (5M9), Marion, Kentucky, about 2030, and was en route to the Williamson County Regional Airport (KMWA), Marion, Illinois.

The pilot was not on a flight plan and was not in radio contact with any air traffic control center. An unconfirmed message from the pilot to his spouse about 2045 reported that the pilot was going to return to the airport; presumably 5M9. The airplane was located on August 10 in a heavily wooded area of the Shawnee National Forest.

A search of radar facilities did not find any primary or secondary radar targets consistent with the accident airplane. The airplane's exact route of flight could not be determined.

Student pilot Information

Certificate:	Student	**Age:**	36,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	May 21, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	30 hours (Total, all aircraft), 30 hours (Total, this make and model)		

The pilot, age 36, held a combined student pilot and second class medical certificate issued on May 21, 2015. At the time of his application for the medical certificate, the pilot reported logging 30 hours of total time with 20 hours accumulated in the preceding six months.

The pilot's log book was not recovered during the course of the investigation, and the pilot's total experience could not be determined. It could not be determined if the pilot had received recent flight instruction and if he possessed a current solo endorsement. The amount of experience he had flying at

night could not be determined.

The passenger was not pilot rated and the student pilot was not authorized to fly with passengers.

Aircraft and Owner/Operator Information

Aircraft Make:	GRUMMAN AMERICAN AVN. CORP.	**Registration:**	N9684U
Model/Series:	AA 5A	**Aircraft Category:**	Airplane
Year of Manufacture:	1975	**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	AA5A-0050
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, not activated	**Engine Model/Series:**	O-320-E2G
Registered Owner:	On file	**Rated Power:**	150 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The accident airplane was a Grumman AA-5A, serial number AA5A-0050, manufactured in 1975. It was powered by a 150-horsepower, normally aspirated, Lycoming O-320-E2G engine which drove a metal, 2-bladed, fixed-pitch, McCauley 1C172/BTM7359 propeller. The airplane's logbooks were not recovered and the airplane's maintenance history was not established. A September 7, 2013 auction listing for the airplane on an internet page, reported the engine hours at 7,578 hours, which also appeared in an included interior photo of the airplane's instrument panel.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	KHSB,396 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	01:35 Local	**Direction from Accident Site:**	17°
Lowest Cloud Condition:	Clear	**Visibility**	5 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	70°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.9 inches Hg	**Temperature/Dew Point:**	25°C / 25°C
Precipitation and Obscuration:	Moderate - None - Mist		
Departure Point:	MARION, KY (5M9)	**Type of Flight Plan Filed:**	None
Destination:	MARION, IL (MWA)	**Type of Clearance:**	None
Departure Time:	20:30 Local	**Type of Airspace:**	

A review of weather information revealed that at 1900 a low pressure system was over western Illinois with an associated frontal wave. A warm stationary front was in the immediate vicinity of the accident site which had the potential to form a partially cloudy sky. The closest weather reporting facility was the Harrisburg-Raleigh Airport (HSB), Harrisburg, Illinois, located about 15 nautical miles north of the accident site at an elevation of 398 feet mean sea level (msl). At 2035 the weather reporting facility at HSB reported wind from 070° at 3 knots, visibility 5 miles in mist, a clear sky, temperature 77° F, dew point 77° F, and a barometric pressure of 29.91 inches of mercury.

Data from the Geostationary Operational Environmental Satellite (GOES) 13 system found that at 2035, the accident site was located in an area ahead of a large mesoscale convective system (MCS). The National Oceanic and Atmospheric Administration (NOAA) National Severe Storms Laboratory defines a MCS as "a collection of thunderstorms that act as a system. An MCS can spread across an entire state and last more than 12 hours." Astronomical Conditions for the accident site found that the moon had set at 1648 and was below the horizon at the time of the accident.

There is no evidence of the pilot receiving a weather briefing prior to the flight.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	37.565555,-88.643333

At the beginning of the debris path, several broken and downed trees tops were found with airplane wing parts suspended in the trees and on the ground. About 55 yards from the start of the tree strikes, generally aligned along a 320° magnetic heading, was an impact point that was about 2.5 feet deep. The main wreckage had come to rest partially outside of the impact point. The debris field continued another 25 yards through the trees. Impact signatures were consistent with the airplane impacting the ground at least 25° nose low.

Portions of the right wing were found near the tree strikes with left wing components found next when walking towards the impact crater. The engine and propeller were found at the bottom of the impact crater with the fuselage and empennage resting on top of the engine. Both wings were fragmented in multiple locations. When reconstructed, all flight controls were accounted for without any evidence of preimpact damage. The engine was removed from the fuselage and examined down to its crankshaft. No preimpact anomalies were detected with the engine. The propeller remained attached the engine at the propeller flange. One blade was curled rearward and displayed chordwise scratches, gouges, and leading edge polishing. The other blade remained straight with light leading edge polishing. No preimpact anomalies were detected with the airframe or engine.

A majority of the cockpit instrumentation was destroyed by impact force. The ignition switch was in the both position. The turn and slip indicator displayed a 45° right bank. The altimeter's Kollmans window displayed 29.92. The emergency location transmitter (ELT) was found separated from the airplane and the switch was found in the OFF position. Soil was deposited in the area surrounding the switch and its preimpact position could not be determined.

Medical and Pathological Information

Although requested, the Pope County Coroner's Office did not perform an autopsy on the pilot, as the office deemed it not necessary due to the high velocity nature of the airplane crash.

A few milliliters of blood were recovered by the Country Coroner's Office. The entire sample was sent to the Federal Aviation Administration (FAA) Civil Aerospace Medical Institute (CAMI) for toxicology. The sample was marked putrefied. Testing detected 29 mg/dL of ethanol.

Administrative Information

Investigator In Charge (IIC):	Aguilera, Jason
Additional Participating Persons:	Curt Lindauer; FAA; Springfield, IL John Butler; Lycoming Engines; Williamsport, PA
Original Publish Date:	August 10, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=91753