Aviation Investigation Final Report

Location:	Clarksville, Texas	**Accident Number:**	CEN17FA028
Date & Time:	October 28, 2016, 18:45 Local	**Registration:**	N377MA
Aircraft:	AVIAT AIRCRAFT INC A-1C-180	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane impacted trees and terrain while on approach to land on a privately-owned grass runway. There were no witnesses to the accident. The airplane came to rest about 2,100 ft from the approach end of runway 24 and about 250 ft left of the extended runway centerline. The accident site was located about where the turn from a left base leg to final approach for landing on runway 24 would be made. Examination of the wreckage indicated that the airplane initially struck trees with its left wing and then impacted the ground in a nose-low attitude. The airplane's close proximity to the initial tree impact, and the attitude at which it struck the ground indicated that the airplane had little forward velocity. Examination of the airplane, its control systems, and engine did not reveal any preimpact anomalies. Based on the available evidence, it is likely that the pilot did not maintain adequate airspeed during the turn from the base leg to final approach, which resulted in the airplane exceeding its critical angle of attack and an aerodynamic stall at a low altitude.

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 sufficient airspeed during the landing approach, which resulted in exceedance of the airplane's critical angle of attack and an aerodynamic stall.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Not attained/maintained
Environmental issues	Tree(s) - Contributed to outcome

Factual Information

History of Flight

Approach-VFR pattern base	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On October 28, 2016, about 1845 central daylight time, an Aviat A-1C-180, N377MA, was destroyed when it impacted trees and terrain while on approach to land at a private airstrip near Clarksville, Texas. The pilot, who was the sole occupant, was fatally injured. The aircraft was registered to ACME Husky, LLC, 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, and a flight plan was not filed. The flight originated from McCurtain County Regional Airport (4O4), Idabel, Oklahoma, at an undetermined time.

The pilot was landing at the private strip to meet his girlfriend and her family. The pilot performed a fly-by of the lodge adjacent to the strip before circling around to land on the runway. The pilot's girlfriend witnessed the fly-by, but did not witness the accident. When the pilot didn't land and come to the lodge, a search was started and the airplane was found that evening.

Pilot Information

Certificate:	Private	**Age:**	24,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
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 3 Without waivers/limitations	**Last FAA Medical Exam:**	July 17, 2012
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	614 hours (Total, all aircraft), 448 hours (Total, this make and model)		

The pilot, age 24, held a private pilot certificate with airplane single-engine land and instrument airplane ratings. A review of the pilot's flight records revealed that he had accumulated about 614 hours of total flight experience, including 447.9 hours in the accident airplane. The most recent flight review recorded in the pilot's logbook was completed on June 23, 2014.

The pilot's family owned the lodge and airstrip where the accident occurred. His logbook did not list flights into or out of the private strip, however, much of the flight time recorded in the accident airplane

was recorded as "block time" with no departure or destination points listed.

The pilot held a third-class medical certificate issued on July 17, 2012. The medical certificate listed no limitations. Based on the pilot's age, the medical certificate was valid until July 31, 2017.

Aircraft and Owner/Operator Information

Aircraft Make:	AVIAT AIRCRAFT INC	**Registration:**	N377MA
Model/Series:	A-1C-180 UNDESIGNAT	**Aircraft Category:**	Airplane
Year of Manufacture:	2008	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	3005
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	January 5, 2016 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	35 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	741.7 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Installed	**Engine Model/Series:**	O-360-A1P
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The airplane was a 2008 Aviat A-1C-180 "Husky," serial number 3005. It had seating for two in a tandem arrangement and was a high-wing, strut-braced fabric-covered monoplane. The fuselage structure was predominately welded steel tubing, and the wing structure was aluminum. The airplane had a conventional (tail-dragger) landing gear and was equipped with oversize "tundra" tires. The airplane was powered by a Lycoming O-360-A1P engine, serial number L-41066-36E. The engine was rated to produce 180-horsepower and powered a 2-blade MT Propellers constant speed propeller.

Maintenance records showed that the airplane's most recent annual inspection was completed on January 5, 2016. At the time of the annual inspection, the airplane had accumulated 706.8 total hours in service. The recording hour meter reading at the accident site was 741.7 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	4O4,472 ft msl	**Distance from Accident Site:**	11 Nautical Miles
Observation Time:	23:35 Local	**Direction from Accident Site:**	5°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	23°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	IDABEL, OK (4O4)	**Type of Flight Plan Filed:**	None
Destination:	Clarksville, TX (PVT)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

At 1835, the weather conditions at 4O4, about 11 nautical miles north of the accident site, were: wind 170° at 5 knots, 10 miles visibility, clear skies, temperature 23°C, dew point 12°C, and altimeter setting 30.12 inches of mercury.

Sunset on the day of the accident was at 1830, and the end of civil twilight was at 1855.

Airport Information

Airport:	Private PVT	**Runway Surface Type:**	Grass/turf
Airport Elevation:	360 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	24	**IFR Approach:**	None
Runway Length/Width:	2900 ft / 75 ft	**VFR Approach/Landing:**	Traffic pattern

The airstrip's grass runway was oriented about 60°/240° and measured about 2,900 ft in length and 75 ft in width.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	33.719444,-94.875

The airplane came to rest in a wooded area about 2,100 ft from the approach end of runway 24 and about 250 ft left of the extended runway centerline. This location was about where a normal turn from a left base leg to final approach for landing on runway 24 would be made.

There were multiple branches broken from trees southeast of the main wreckage, indicating that the airplane's direction of travel at the time of impact was about 330°, consistent with the heading of a left base leg for runway 24. The base of the tree that was first struck was about 50 ft from the main wreckage.

The airplane's fuselage was oriented on a heading of 135° and was predominately intact with crush damage to the forward end. The crush angle of the lower forward fuselage was consistent with a steep nose-down impact angle. The aft fuselage was intact with no apparent damage to the structure aft of the cabin. The vertical stabilizer, rudder, horizontal stabilizer, and elevator remained attached to the fuselage and were intact.

The right wing was predominately intact with denting of the entire leading edge and aft crushing of the outboard leading edge near the wing tip. The wing spars remained attached to the fuselage structure. The aileron and flap remained attached to the wing structure. The fuel tank was breached; however, a portion of the tank still contained an unknown quantity of fuel. Both wing struts were bent but remained attached at both ends.

The left wing was structurally separated from the fuselage and remained attached by one aileron cable and the flap control cable. The wing came to rest in an inverted position next to the fuselage. The wing spar attachment bolts were still in place on the fuselage. The forward and aft wing spar lugs were separated due to impact. The entire wing structure was fragmented with rearward crushing along the entire length. The aft spar had crushed rearward into the flap and aileron, but the flap and aileron remained attached. The left wing tip was separated, and a portion of the tip was found hanging from a tree near the initial impact point. The forward wing strut was bent but remained attached to the fuselage and wing fittings. The straps that attached the strut to the wing structure were intact and still attached, but the wing structure that the straps attached to had been pulled from the remainder of the wing. The rear wing strut attachment eye at the fuselage was fractured during the impact. The welded fitting at the wing attachment end of the strut had separated due to impact. The separated end of the strut remained attached to the wing.

The airplane's control system was examined to establish continuity. The rudder cables were intact from the forward seat rudder pedals to the rudder control surface. The elevator control continuity was

confirmed by movement of both cockpit control sticks with corresponding movement of the elevator control surface. Aileron continuity was established by tracing of the control cable from the cockpit controls to the aileron control surfaces. There was an overload failure of the aileron balance cable within the left wing. With the exception of the break in the balance cable, the rest of the aileron control cables were intact. The flap control cable was traced from the flap handle in the cockpit to the surfaces with no breaks found. The flap return springs were in place and attached. The position of the flap control could not be determined due to extensive crushing damage in that area of the fuselage. No anomalies were found that would indicate a failure of the flight control systems.

The airplane was recovered from the accident scene and transported to a facility for further examination of the engine. The propeller hub remained attached to the engine, and both propeller blade shanks remained attached to the hub. The propeller blades had a wood core with composite covering. Both blades were separated and splintered. The engine was removed from the firewall. The upper set of spark plugs were removed, and the valve rocker covers removed. The engine was free to rotate, and valve train continuity was confirmed by noting valve movement during rotation. Suction and compression were confirmed on all cylinders during rotation. The left magneto produced spark on all leads during engine rotation. The right magneto was not equipped with an impulse coupling and was removed from the engine. When rotated with an electric drill, the right magneto produced spark on all leads. The engine carburetor was broken loose from the engine and had impact damage to the mixture control arm. The carburetor was disassembled, and the fuel bowl was clean and free of debris. There was a small quantity of fuel remaining in the bowl. A test with water detecting paste showed that the fuel that remained in the bowl did not have any entrained water.

Medical and Pathological Information

American Forensics, Dallas, Texas performed an autopsy of the pilot. The pilot's death was attributed to injuries received in the accident.

The Federal Aviation Administration Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on the pilot's specimens. Testing results were negative for all substances in the screening profile.

Administrative Information

Investigator In Charge (IIC):	Brannen, John
Additional Participating Persons:	Shane Olsen; FAA - North Texas FSDO; Irving, TX Eric Meyn; DOT - Transportation Safety Institute; Oklahoma City, OK John Butler; Lycoming Engines; Dallas, TX
Original Publish Date:	August 2, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=94311