Aviation Investigation Final Report

Location:	Atmore, Alabama	**Accident Number:**	WPR18LA142
Date & Time:	May 11, 2018, 12:03 Local	**Registration:**	N9216E
Aircraft:	Kolb Firestar	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The noncertificated pilot had purchased the experimental amateur-built airplane about 1 year before the accident and had accrued about 4 hours of experience in the airplane make and model. His wife reported that the accident flight was his first actual flight in the airplane, as his previous activities had been limited to taxiing and a maneuver in which the airplane intentionally became momentarily airborne while traveling down the runway.

An externally mounted onboard video camera recorded the pilot's entire 13-minute personal flight and showed that after takeoff, the airplane climbed to an altitude of about 500 to 750 ft above ground level. About 6 minutes after takeoff, the airplane began maneuvers consistent with an aerodynamic stall and spin. The airplane first banked and turned sharply right, the nose pitched down, and then the airplane banked and turned sharply left, descending rapidly during this sequence. Within a few seconds, the airplane struck a tree and then impacted the ground; the fuselage, tail boom, and wings sustained substantial damage.

Examination of the airplane did not reveal any preimpact mechanical malfunctions or failures that would have precluded normal operation.

The pilot indicated that his total flight time was about 36 hours, most of which were accrued about 20 years before the accident. The pilot's limited overall flight experience, combined with his lack of recent flight training or any instruction in the accident airplane make and model, likely prevented him from recognizing, avoiding, and recovering from an aerodynamic stall.

Probable Cause and Findings

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

The noncertificated pilot's failure to maintain airplane control, which resulted in an aerodynamic stall. Contributing to the accident was the pilot's lack of flight experience and qualification.

Findings

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

Factual Information

History of Flight

Enroute-cruise	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On May 11, 2018, about 1203 central daylight time, an experimental amateur-built Kolb Firestar 2 airplane, N9216E, sustained substantial damage when it impacted a tree and terrain near Atmore, Alabama. The non-certificated pilot was seriously injured. The airplane was registered to and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed. The local flight had departed Atmore Municipal Airport (OR1), Atmore, Alabama about 13 minutes prior to the accident.

According to the pilot, he was in cruise flight at an altitude of about 600 ft above ground level (agl) when the airplane began "swaying left and right;" the pilot clarified that the airplane was "not yawing or rolling." He was unable to get the airplane "to straighten out," so he began a descent. When it was about 40 ft agl, the airplane struck a tree, and then a powerline, and then impacted the ground.

The airplane came to rest inverted on the lawn of a private residence, and the fuselage, tail boom, and wings were substantially damaged.

Pilot Information

Certificate:	None	**Age:**	47,Male
Airplane Rating(s):	None	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	None None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	36 hours (Total, all aircraft), 4 hours (Total, this make and model), 4 hours (Last 90 days, all aircraft)		

The pilot's flight logbook was recovered from the wreckage. The logbook indicated that the pilot had accrued about 32 hours in Cessna airplanes more than 20 years ago, but then ceased flying until September 2017, when the pilot logged some time in an Aeronca Champ. The pilot's accident report stated that he had accrued a total flight time of 36.1 hours, including 13.6 hours as pilot in command, and 4 hours in the airplane accident make and model in the last 90 days. A search of Federal Aviation Administration (FAA) records did not reveal any pilot or medical certificates for the pilot.

The pilot's wife reported that this was the first time to her knowledge that the pilot had flown the airplane. She reported that he had previously taxied the airpalne, and conducted "crow hopping" exercises in it as well. She defined crow hopping as a maneuver where the pilot would accelerate on the runway and allow the airpalne to become momentarily airborne before touching down and stopping.

For undetermined reasons, the pilot erroneously reported a departure time of 1030, and an accident time of 1045, in his written account of the accident.

Aircraft and Owner/Operator Information

Aircraft Make:	Kolb	**Registration:**	N9216E
Model/Series:	Firestar II	**Aircraft Category:**	Airplane
Year of Manufacture:	2017	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	01-17
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	630 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	45 Hrs at time of accident	**Engine Manufacturer:**	Rotax
ELT:	Not installed	**Engine Model/Series:**	503
Registered Owner:		**Rated Power:**	50 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The kit-built airplane was registered to the pilot about a year before the accident, but he was not the builder of the airplane. The airplane structure consisted primarily of aluminum tubing covered with fabric skin. The airpalne was equipped with a 50 hp Rotax 503 series engine mounted in an overwing pusher configuration. Pilot-provided information indicated that the airframe had a total time (TT) in service of about 45 hours, and the engine had a TT of about 96 hours. No maintenance records were provided to the investigation.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	NSE	**Distance from Accident Site:**	29 Nautical Miles
Observation Time:	11:56 Local	**Direction from Accident Site:**	135°
Lowest Cloud Condition:	Few / 6000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/ Unknown
Wind Direction:	160°	**Turbulence Severity Forecast/Actual:**	/ Unknown
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	31°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Atmore, AL (OR1)	**Type of Flight Plan Filed:**	None
Destination:	Atmore, AL (OR1)	**Type of Clearance:**	Unknown
Departure Time:	11:57 Local	**Type of Airspace:**	Unknown

The 1156 automated weather observation at an airport located about 29 miles southeast of the accident site included wind from 160° at 6 knots, visibility 10 miles, few clouds at 6,000 ft, temperature 31°C, dew point 12°C, and an altimeter setting of 30.13 inches of mercury.

Inflight images depicted clear skies, and were consistent with little or no wind.

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	31.016111,-87.446662(est)

The accident site was located about 4 miles east-northeast of OR1. Evidence indicated that the airplane struck a tree about 25 yards away from where the airplane came to rest, and that it also struck at least one powerline between the tree and the ground impact point. Ground scars indicated little to no horizontal travel during or after ground impact.

The two FAA inspectors who responded to the accident site on the day of the accident conducted a limited examination of the aircraft, and did not observe any pre-impact damage. Throttle and flight control continuity was unable to be verified. The ailerons, elevator, and rudder all remained securely attached to their respective airfoils and control links. Impact damage precluded determination of the pre-accident integrity of the aircraft structure or its control systems.

The fuel tank was approximately ¾ full, and there was fuel in the bowls of each of the two carburetors. The exhaust manifold was removed from the engine to examine the pistons and cylinders, and no pre-impact damage or abnormalities were observed.

Additional Information

A Go-Pro brand video camera was found attached to the exterior of the aircraft. Review of the data on the camera's memory card indicated that the camera recorded the entire accident flight. The camera was mounted low on the outside of the right fuselage, faced forward, and did not capture any aerodynamic surfaces, instruments, controls, or the engine/propeller. Except when the pilot's arm reached out of the cockpit to adjust the camera or something near it, the camera did not capture any of the pilot's anatomy.

The following events (in file elapsed time, format MM:SS) were observed during review of the video file. The airplanet began taxiing on the ramp about 00:15, and stopped on the midfield perpendicular taxiway about 01:20. About 01:48 he resumed taxiing towards the runway, and then the airplane crossed the point-hold line, and entered the airport movement area. About 02:30 the airplane stopped in the movement area between the point hold line and the runway, and remained there for about 30 seconds before entering the runway. The airplane turned left (south) onto the runway, and took about 1 1/2 minutes to taxi to the runway 36 end. The airpalne remained at the left (east) side of the runway for that entire taxi. The aircraft remained on the runway 36 end for about 2 1/2 minutes before it began its takeoff roll. The 14 second takeoff roll was conducted well to the right of the runway centerline. About 2 minutes after takeoff, when the airplane appeared to be level at an altitude of about 500 to 750 ft above ground level, the airplane made a right turn to a heading of east. During the next 3 minutes, the altitude appeared to decrease slowly, and the heading drifted towards the northeast. About 12:30, the airplane turned right, towards the southeast. 20 seconds later, the airplane turned right to a heading of south, and then began maneuvers consistent with an aerodynamic stall. The airplane first banked and turned sharply right, the nose pitched down, and then the airplane banked and turned sharply left, descending rapidly during this sequence. The left and right turns both appeared to result in approximate 180° heading changes. About 13:00, the airplane struck a tree and then impacted the ground. The airplane was descending rapidly in a wings level attitude, and with a forward horizontal velocity component, when it struck the tree. About 14 seconds after the airplane came to rest, significant image vibration, similar to that resulting from engine operation, ceased. The file ended at 17:42; there was no visible activity or camera movement between the time of ground impact and the end of the file.

Administrative Information

Investigator In Charge (IIC):	Huhn, Michael
Additional Participating Persons:	Nina McBride; FAA; Vestavia Hills , AL
Original Publish Date:	June 3, 2020
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97254