Aviation Investigation Final Report

Location:	Adel, Georgia	**Accident Number:**	ERA19FA068
Date & Time:	December 18, 2018, 15:00 Local	**Registration:**	N203SW
Aircraft:	Saberwing Saberwing	**Aircraft Damage:**	Substantial
Defining Event:	Aircraft structural failure	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane broke up in-flight and the wreckage was located about 6 miles southwest from the airport, scattered over a large swamp area; there were no witnesses to the accident. Examination of the airplane revealed that the wing forward spar had two significant failure areas on both the left and right wings; one was located at the side of the fuselage and one was located at the outboard wing attach points. This was indicative of shear failure of the rear spar upper attach bolts and tensile overload at the rear spar upper spar cap. The primary wing failures were due to negative overload causing failure of the upper attach points on the left and right wings.

High positive loads on the horizontal stabilizers would generate downward bending loads in the fuselage that would be greatest at the rear spar location. Given these findings, it is likely that the pilot performed a pull-up maneuver aggressively or at high speed, possibly while performing aerobatics. The pull up would have generated significant down force on the tail, resulting in the left and right fuselage longerons failing in tensile overload due to the downward bending loads in the fuselage in excess of the structural capabilities of the airplane. This sudden failure would cause the airplane to pitch over violently resulting in the negative overload wing failure.

Probable Cause and Findings

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

The in-flight failure of the fuselage, as a result of the pilot conducting maneuvers that exceeded the structural capabilities of the airplane.

Findings

Aircraft	(general) - Capability exceeded
Personnel issues	Unnecessary action - Pilot
Aircraft	Longerons/stringers (main fus) - Capability exceeded
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Maneuvering-aerobatics	Aircraft structural failure (Defining event)

On December 18, 2018, about 1500 eastern standard time, an experimental amateur-built Azalea Saberwing, N203SW, was destroyed during an inflight breakup near Adel, Georgia. The private pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to a witness, the pilot was flying in the traffic pattern at the Cook County Airport (15J), Adel, Georgia, before departing the area to the west. Another witness, located about 6 miles west of 15J, arrived home and observed airplane parts scattered in his yard. There were no witnesses to the accident.

Pilot Information

Certificate:	Private	**Age:**	56,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3	**Last FAA Medical Exam:**	November 1, 2016
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 1100 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Saberwing	**Registration:**	N203SW
Model/Series:	Saberwing	**Aircraft Category:**	Airplane
Year of Manufacture:	2017	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	003
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	July 15, 2018 Annual	**Certified Max Gross Wt.:**	1120 lbs
Time Since Last Inspection:	27 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	101 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	XIO-360-M1B
Registered Owner:		**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The Azalea Saberwing was an experimental, amateur-built, single-engine, low wing, composite airplane with a conventional tail and fixed conventional landing gear. The airplane was primarily manufactured from fiberglass composite sandwich panels using woven and unidirectional fiberglass cloth with foam core that was infused with resin. The fuselage bulkheads, wing spars, and tail spars were constructed of wood. The center portion of the wing, about 7 ft long, was bonded in the lower fuselage during construction, and the outboard portions of the wings were attached through bolted fittings on the forward and aft spars. The forward and aft wing spars were a wooden box design with Sitka spruce spar caps and ribs and Birch plywood webs.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	MGR,283 ft msl	**Distance from Accident Site:**	13 Nautical Miles
Observation Time:	15:15 Local	**Direction from Accident Site:**	264°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.06 inches Hg	**Temperature/Dew Point:**	18°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Adel, GA (15J)	**Type of Flight Plan Filed:**	None
Destination:	Adel, GA (15J)	**Type of Clearance:**	None
Departure Time:	11:00 Local	**Type of Airspace:**	Class G

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:**	31.10361,-83.553054(est)

The wreckage was located in a swampy area 6 miles southwest from 15J; the wreckage field was about 6,000 ft long by 1,000 ft wide. The fuselage fractured near the aft wing spar; additionally, the left and right outboard wings, vertical stabilizer, rudder, horizontal stabilizer, and elevator were dispersed amongst the wreckage field consistent with an inflight breakup of the airplane. At the beginning of the debris field, the vertical stabilizer was located; it was separated into 2 pieces. The next part that was located was the rudder, which was separated from the vertical stabilizer. The entire horizontal stabilizer assembly was then located, with both elevators still attached and intact. There was no damage to the aft fuselage below the tail. The left flap assembly was located next along the debris path on the left side of the debris field. The right wing assembly was located on the right side of the debris field and included the aileron, flap, and landing gear assembly. The empennage was found forward of the right wing assembly. The cockpit and engine were found near the end of the debris field. The engine remained attached to the engine mounts and attached to the firewall of the cockpit section. All three propeller blades were broken at the propeller hub. All of the propeller blades had scoring and impact marks throughout the span of the blades. The left wing was not located during the

initial search but was later found on February 1, 2019, in the swamp near where the cockpit was located. Examination of the fuselage longerons that ran below the canopy revealed that they had fractured in tension overload, on both sides of the fuselage near the location of the rear spar. The tensile fractures were consistent with fuselage bending in the downward direction.

Medical and Pathological Information

The Division of Forensic Sciences, Georgia Bureau of Investigation, performed an autopsy on the pilot. His cause of death was multiple blunt force injuries.

Toxicology testing performed at the FAA Forensic Sciences Laboratory was negative for carbon monoxide, ethanol, and drugs.

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric		
Additional Participating Persons:	Danny Cox; FAA/FSDO; Atlanta, GA Mike Caldera; Lycoming; Williamsport, PA David Poirier; Azalea Aviation LLC.; Adel, GA William M Clapp; Azalea Aviation LLC; Adel, GA		
Original Publish Date:	December 3, 2020	**Investigation Class:**	2
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98785		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available here.