



National Transportation Safety Board Aviation Accident Final Report

Location:	Beaufort, SC	Accident Number:	ERA18LA095
Date & Time:	03/05/2018, 0935 EST	Registration:	N221YT
Aircraft:	ROBERT SNYDER AUTOGYRO CALIDUS	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

After performing a normal takeoff, the private pilot of the gyroplane transmitted over the radio that he was going to conduct a simulated engine-out maneuver and return to the opposite runway. Witnesses saw the gyroplane flying toward the runway erratically and at low altitude over a field. The gyroplane's nose pitched up, and the gyroplane rolled inverted before impacting a grass area to the side of the runway. One witness, who was also a pilot, estimated that the gyroplane climbed to 300 to 500 ft above ground level before performing the maneuver and speculated that it may not have been enough altitude to complete the maneuver.

Examination of the wreckage did not reveal any preimpact mechanical malfunctions and the two main rotor blades did not exhibit significant rotational damage. It is likely that, as the pilot was maneuvering aggressively at low altitude with the engine power at idle, he allowed the main rotor speed to decay, which resulted in a subsequent loss of control and impact with terrain.

Probable Cause and Findings

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

The gyroplane pilot's failure to maintain rotor speed and aircraft control as he was attempting to return to the runway during a low-altitude simulated engine-out maneuver.

Findings

Aircraft	Prop/rotor parameters - Not attained/maintained (Cause)
	Lateral/bank control - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause)

Factual Information

On March 5, 2018, about 0935 eastern standard time, an experimental, amateur-built Autogyro Calidus gyroplane, N221YT, was substantially damaged when it impacted terrain during approach to Beaufort County Airport (ARW), Beaufort, South Carolina. The private pilot was fatally injured. The gyroplane was owned and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed for the local personal flight, which departed ARW about 0932.

According to a witness who worked at the airport, the pilot of the gyroplane made a transmission on the airport's common traffic advisory frequency (CTAF) that he was taking off on runway 25. The witness observed the gyroplane take off and climb to about 75 ft above ground level about halfway down the 3,434-ft-long runway. The gyroplane was climbing slowly, and everything appeared normal. The witness did not continue to watch the gyroplane but heard the pilot make another routine radio transmission at 0933. At 0937, the witness received a telephone call that the gyroplane had crashed near the departure end of runway 25 at 0935. The caller reported to the witness that the gyroplane was low over a field when it rolled inverted and impacted a marsh.

Another witness reported that he was taxiing his airplane for takeoff on runway 7 at ARW. The gyroplane had just taken off and the accident pilot announced on the CTAF that he was departing on runway 25 and returning to runway 7 with a simulated engine out. The witness estimated that the gyroplane climbed to 300 to 500 ft above ground level before performing the maneuver. By the time the witness's airplane reached the runway 7 threshold, the gyroplane had crashed. The witness further stated that it was possible that the accident pilot did not obtain enough altitude to perform the maneuver.

A third witness was driving his car near the departure end of runway 25. He stated that the gyroplane climbed from the runway and flew over a road at the departure end. At that time, it appeared to be flying straight. About 10 seconds later, the gyroplane reversed direction and seemed to be flying back toward the departure end of the runway. The gyroplane was flying erratically and looked like it was "performing tricks;" specifically, the nose was pitching up, down, left, and right. As the gyroplane neared the runway, the nose pitched up and the gyroplane rolled inverted and impacted the ground.

A fourth witness reported that he was sitting on the tailgate of his pickup truck in the parking lot of a department store adjacent to the airport. The witness watched the accident gyroplane perform touch-and-go landings. The witness estimated that the gyroplane performed four touch-and-go landings over a period of 15 to 20 minutes before the accident occurred. The pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. He also held a sport pilot certificate. The pilot's most recent Federal Aviation Administration (FAA) third-class medical certificate was issued on September 13, 2017. At that time, he reported 921 total hours of flight experience. Review of the pilot's logbook revealed that he had accrued about 944 total hours of flight experience at the time of the accident, of which about 91 hours were in the accident gyroplane. The pilot had flown about 6 hours during the 30 days preceding the accident, all of which were in the accident gyroplane.

He flew 9 hours during the 90 days preceding the accident and all but 1 of those hours were in the accident gyroplane.

The two-seat tandem, fixed tricycle gear, composite gyroplane was assembled from a kit and issued an FAA experimental airworthiness certificate in 2015. It was powered by a Rotax 912ULS, 100-horsepower engine, equipped with an HTC three-blade, ground adjustable, composite pusher propeller and a two-blade aluminum rotor. Review of the maintenance records revealed that the gyroplane's most recent condition inspection was completed on April 22, 2017. At that time, the airframe and engine had accumulated 183.5 total hours of operation.

The 0935 recorded weather at ARW included wind from 310° at 4 knots, 10 statute miles visibility, clear sky, temperature 12°C, dew point 4°C, and altimeter setting of 30.13 inches of mercury.

Examination of the wreckage by an FAA inspector revealed that it came to rest on its right side north of the departure end of runway 25. There was no debris path noted and the fiberglass cockpit and engine enclosures were destroyed. The nose section, with the nose landing gear attached, had separated from the fuselage, but all associated cables remained attached. The main landing gear was partially collapsed. The tailboom was twisted and canted to the left of the fuselage, with its horizontal stabilizer bent upward. All three propeller blades were fractured. One main rotor blade separated from the hub and exhibited an approximate 90° upward bend near the blade root. The other main rotor blade remained attached to the hub and did not exhibit damage with the exception of separation near the blade tip. One fuel tank was breached during impact. The other fuel tank remained intact and contained about 5 gallons of automotive fuel. No water or other contamination appeared in the fuel. The engine remained intact and attached to its mounts.

Two FAA inspectors examined the wreckage after it was recovered to a hangar. Due to the disposition of the wreckage, they were only able to rotate the propeller about 90°, but they noted no binding and observed continuity through the engine. The gyroplane's flight controls consisted of push-pull tubes that sustained impact damage; however, there was no evidence of a preaccident flight control discontinuity.

The Medical University of South Carolina, Charleston, South Carolina, performed an autopsy on the pilot. The autopsy report noted the cause of death as blunt trauma to head and chest.

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing on specimens of the pilot. The results were negative for drugs and alcohol.

History of Flight

Initial climb	Simulated/training event
Approach	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private; Sport Pilot	Age:	69, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With Waivers/Limitations	Last FAA Medical Exam:	09/13/2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	11/17/2016
Flight Time:	944 hours (Total, all aircraft), 91 hours (Total, this make and model), 9 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	ROBERT SNYDER	Registration:	N221YT
Model/Series:	AUTOGYRO CALIDUS NO SERIES	Aircraft Category:	Gyroplane
Year of Manufacture:	2015	Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	C00360
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	04/22/2017, Condition	Certified Max Gross Wt.:	990 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	183.5 Hours as of last inspection	Engine Manufacturer:	Rotax
ELT:	Not installed	Engine Model/Series:	912ULS
Registered Owner:	EMERALD AIR OF SC LLC	Rated Power:	100 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	ARW, 9 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	0935 EST	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	4 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	310°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	30.13 inches Hg	Temperature/Dew Point:	12° C / 4° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Beaufort, SC (ARW)	Type of Flight Plan Filed:	None
Destination:	Beaufort, SC (ARW)	Type of Clearance:	None
Departure Time:	0932 EST	Type of Airspace:	

Airport Information

Airport:	Beaufort County Airport (ARW)	Runway Surface Type:	Asphalt
Airport Elevation:	9 ft	Runway Surface Condition:	Dry
Runway Used:	7	IFR Approach:	None
Runway Length/Width:	3434 ft / 75 ft	VFR Approach/Landing:	Simulated Forced Landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	32.412222, -80.634444 (est)

Administrative Information

Investigator In Charge (IIC):	Robert J Gretz	Report Date:	10/10/2018
Additional Participating Persons:	Daryl McMillan; FAA/FSDO; Columbia, SC		
Publish Date:	10/10/2018		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=96822		

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](#).