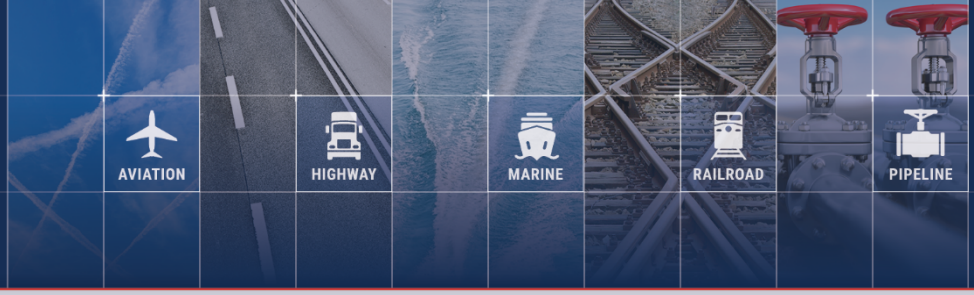

Aviation Investigation Final Report

Location:	Ephrata, Washington	**Accident Number:**	WPR09LA318
Date & Time:	June 29, 2009, 14:15 Local	**Registration:**	N129TD
Aircraft:	ALEXANDER SCHLEICHER GMBH & CO ASW 27-18E	**Aircraft Damage:**	Substantial
Defining Event:	Aircraft structural failure	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was preparing for a glider competition with other glider pilots. Witnesses were flying their gliders in the area and reported seeing the glider thermalling, then entering a spin to the right. During the spin, the rotation increased into a rapid rotation and then into a graveyard spiral. One witness reported that during the second spiral rotation the outboard wingtip panels arched upward. Following the flexing of the wings, it appeared that they "...disintegrated...The wings looked like they exploded." The witness did not see a parachute. Examination of the glider revealed no preimpact mechanical anomalies. Toxicological evaluation of tissue samples from the pilot were consistent with the use of marijuana and of diazepam (a prescription anti-anxiety medication also known by the trade name Valium) at some time prior to the accident, but no blood was available for analysis and no estimate could be made of when the substances were last used or whether the pilot may have been impaired by their use.

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 control of the glider during flight and his exceedance of the glider's design limits during an attempted recovery from a spin.

Findings

Aircraft	Spar (on wing) - Capability exceeded
Aircraft	(general) - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Maneuvering	Loss of control in flight
Maneuvering	Aerodynamic stall/spin
Maneuvering	Aircraft structural failure (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On June 29, 2009, at 1415 PDT, an Alexander Schleicher GMBH and Company ASW 27-18E glider, N129TD, broke apart in midair while maneuvering in thermal activity approximately 10 miles north of Ephrata, Washington. The private pilot was operating the glider under the provisions of 14 Code of Federal Regulations Part 91. The pilot was killed and the glider sustained substantial damage. Visual meteorological conditions prevailed and no flight plan was filed. The glider departed from Ephrata Municipal Airport, Ephrata, Washington.

According to a glider pilot, the group of gliders was preparing for the 18 Meter Competition. He stated, “While en route and on course heading north from Ephrata Airport, I headed towards two gliders in a thermal at approximately 3,000 feet above the ground and 1-mile ahead. One glider was above the other by approximately 500 feet. While in a tight banked turn, the glider below stalled his aircraft and went into what appeared to be a normal spin. I counted 3-turns in the spin and saw no attempt whatsoever at a recovery. There was nothing unusual about the glider's attitude in the spin. After 3-turns the glider then attained a more nose down attitude and went into a high speed spiral dive. After approximately 2-turns the wing tore off due to the heavy 'G' loads on the aircraft. After the wing departed, the glider increased its speed and dove into the ground at a very high velocity.”

According to another glider pilot participating in the competition, “...I saw the glider ahead of me that was maneuvering in what looked like a good thermal. I first saw the wing flash of the accident glider when it was about 3 miles ahead of me. It looked like it was climbing so I decided to join the glider in the thermal. As I approached the glider, I was careful to look around for other aircraft in the vicinity. There were no other gliders or hang gliders in the thermal. There was no significant turbulence. The glider was circling to the right. As I got closer to the glider, I clearly saw the content number, X8. A review of my data logger after the flight indicated that I was at 6,400 feet mean sea level. Ground level was about 2, 200 feet."

Additionally, he stated, “I pulled in behind X8 intending to thermal with him. I would estimate we were about 500 feet apart. I was about 100 to 200 feet above X8. I do not know if he saw me or if he was aware of my presence. After about 90 degrees of turn, I observed X8 yaw to the right and subsequently roll into a right hand spin. From my vantage point there was no

abnormal pitch up prior to the stall/spin. My airspeed was between 55 and 60 knots. His would have been about the same. The nose of X8 quickly, but very smoothly, pitched down to nearly vertical as the glider started its spin rotation about the vertical axis. The spinning glider rotated precisely about the vertical axis with no undulations or oscillations. The spin had no tendency to flatten out. It was a typical glider spin. The inside wing was stalled. The outside wing was not."

The witness further reported, "I was looking straight down at the spinning glider while circling above. After the glider completed three complete 360-degree turns in the spin, the wing recovered from the stall but the rotation did not stop. In fact, the relatively slow spin rotation increased to an extremely rapid rotation and developed almost instantly into a very tight graveyard spiral. The radius of the spiral turns tightened almost instantly to about one quarter or less the radius of the spin turns. There was no perceptible change in the pitch attitude from my vantage point."

"The glider completed one, maybe two rotations in this extremely tight spiral. On about the second spiral rotation I saw the outboard wingtip panels arch upward. The entire wing was flexing but the outboard panels (tips) were smoothly and uniformly arching such that the wing tips were nearly vertical from severe positive G-loading. The glider continued in the spiral with the wings in this flexed state for just a few seconds. Almost immediately following the severe flexing of the wings, the wings disintegrated…The wings looked like they exploded. Small pieces of wing panels, water ballast, and debris went everywhere. I could only see a few of the larger pieces flutter to the ground. From my vantage point, I did not see what happened to the fuselage. There was no parachute."

PERSONNEL INFORMATION

The pilot, age 52, held a private pilot certificate for single- and multi-engine airplanes, single-engine seaplanes, and gliders. He also held an instrument rating. The pilot's last medical certificate was a third-class and issued on May 2, 2008; it held the restriction that the pilot must have available glasses for near vision. The pilot reported 3,200 flight hours on his last medical application, with 80 hours in the past 6 months.

Excerpted copies of the pilot's logbooks were obtained from the attorney of the estate. The most recent glider flight time logged was dated August of 2008 and showed 456 total glider hours. Exact calculations of the pilot's overall flight time and glider flight hours at the time of the accident could not be determined with the available logbook copies.

The pilot obtained a single-engine seaplane rating on April 17, 2009, which served as his flight review.

GLIDER INFORMATION

The glider, serial number (SN) 29567, was issued its airworthiness certificate in November of

2008. It was equipped with a Solo Type 2350 engine that was propelled by a Schleicher AS2F1-2/L120-43-N2 propeller.

According to Federal Aviation Administration Aircraft Registration records, the glider was registered to its current owner on November 4, 2008. A friend of the pilot reported that after he purchased the glider, the glider was transported to Seminole, Florida, for the winter. Then the glider was transported to New Castle, Virginia. The pilot's friend said that the pilot made several visits to Florida over the winter and at least one to New Castle.

METEOROLOGICAL INFORMATION

At 1453, an aviation routine weather report (METAR) at Ephrata Municipal Airport, Ephrata, Washington, located approximately 10 miles south of the accident site, was reporting the following; winds were from 220 degrees at 7 knots, visibility, 10 statute miles; sky condition clear; temperature, 81 degrees Fahrenheit; dew point, 30 degrees Fahrenheit; altimeter, 29.92 inHg.

FLIGHT RECORDERS

A Colibri flight recorder was recovered from the glider wreckage and sent to the Safety Board Vehicle Recorder Laboratory. According to the specialist, the data retaining SD card contained in the unit was cracked. Discussions with the manufacturer of the unit indicated that no data retrieval from the unit was possible.

WRECKAGE AND IMPACT INFORMATION

The main wreckage came to rest in a wheat field at an elevation of approximately 2,600 feet mean sea level. According to initial responders, there were multiple pieces of the glider that had separated and were not located in the immediate vicinity.

The glider was recovered from the accident site by a recovery company who obtained global positioning system coordinates for each major piece of wreckage and indicated that the debris path was on a path of 130-degrees. The following areas and wreckage portions were noted: impact crater, engine, tailboom, right wing tip, main spars, left inboard wing section, left outboard wing section, and the left wing skin. Other pieces of the wreckage which included light composite wing sections were later located and recovered.

MEDICAL AND PATHOLOGICAL INFORMATION

The Douglas County Coroner completed an autopsy on the pilot. The manner of death was classified as an accident from injuries sustained in the accident. The FAA Bioaeronautical Research Laboratory completed toxicology testing. Carbon monoxide and cyanide testing were not performed; volatile and drug testing were performed. The testing was positive for the following:

22 (mg/dL, mg/hg) Ethanol detected in muscle
No Ethanol detected in liver
1 (mg/dL, mg/hg) N-Propanol detected in muscle
0.126 (ug/ml, ug/g) Nordiazapam detected in kidney
0.106 (ug/ml, ug/g) Nordiazepam detected in liver
0.0421 (ug/ml, ug/g) Tetrahydrocannabinol (marihuana) detected in kidney
0.0166 (ug/ml, ug/g) Tetrahydrocannabinol (marihuana) detected in muscle
0.0538 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (marihuana) detected in kidney
0.0223 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (marihuana)detected in liver
Tetrahydrocannabinol Carboxylic Acid (marihuana)detected in muscle

The toxicological report noted that the ethanol found in this case was from sources other than ingestion.

TESTS AND RESEARCH

The wreckage was examined by investigators following its recovery from the accident site. The recovered wreckage was extensively fragmented and the largest pieces were inboard and outboard sections of the left wing. All flight control surfaces, or portions of them, were identified in the wreckage.

The vertical stabilizer was split into two sections and the rudder remained attached. The rudder cables remained secured at the base of the rudder and were continuous to the cockpit area. The right outboard portion of the horizontal stabilizer was identified and contained a 2-inch by 3-inch puncture hole in the leading edge. A portion of the elevator was attached. The left horizontal stabilizer was identified and fractured mid-elevator. A portion of the elevator remained attached.
The left inner wing had separated at the center fork and then midspan at the outer wing connection point. The winglet was separated and was recovered loose within the recovered wreckage. Portions of the flaperons and ailerons were identified. The left airbrake was intact and sustained minimal damage. The left wing ballast plug was in place and the drain hole tape was still secure.

The right wing was extensively fragmented. The winglet had separated at its mounting point. Portions of the right airbrake were identified within the recovered wreckage. The right wing ballast plug and drain were not identified.

The center section fork pins and spars were documented. The pins remained in the pin holes but the spar sections had separated from each other. Portions of the control interconnections were identified within the wreckage. Identifiable portions of the cockpit were examined. Portions of the canopy frame were identified loose within the wreckage.

Pilot Information

Certificate:	Private	**Age:**	52,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
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:**	May 2, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 17, 2009
Flight Time:	3200 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	ALEXANDER SCHLEICHER GMBH & CO	**Registration:**	N129TD
Model/Series:	ASW 27-18E	**Aircraft Category:**	Glider
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	29567
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	November 13, 2008 Condition	**Certified Max Gross Wt.:**	1322 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	0 Hrs as of last inspection	**Engine Manufacturer:**	Solo
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	2350
Registered Owner:	Emerald Eagle LLC	**Rated Power:**	26 Horsepower
Operator:	Timothy Donovan	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	EPH,1276 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	14:53 Local	**Direction from Accident Site:**	350°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.92 inches Hg	**Temperature/Dew Point:**	27°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ephrata, WA (EPH)	**Type of Flight Plan Filed:**	None
Destination:	Ephrata, WA (EPH)	**Type of Clearance:**	None
Departure Time:	13:15 Local	**Type of Airspace:**	

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:**	47.546112,-119.586669(est)

Administrative Information

Investigator In Charge (IIC):	Dunks, Kristi
Additional Participating Persons:	Robert Rasmussen; Federal Aviation Administration; Spokane, WA
Original Publish Date:	April 22, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=74165