Aviation Investigation Final Report

Location:	Moriarty, New Mexico	**Accident Number:**	CEN18FA262
Date & Time:	July 10, 2018, 15:07 Local	**Registration:**	N753R
Aircraft:	SCHEMPP-HIRTH FLUGZEUGBAU GMBH VENTUS 3F	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was conducting a local flight in his motorglider in day visual meteorological conditions. Another glider pilot in the area reported hearing the accident pilot announce over the radio that he was not getting any lift and was going to stay near the airport. About 2 hours after the pilot departed on the flight, a witness on the ground saw the glider as she was driving near the airport. The glider was in a nose-down attitude very close to the ground; she thought that it might be landing. She subsequently turned her car and lost sight of the glider.

A search was initiated when the glider did not return to the airport as expected, and the wreckage was located about 1/2 mile southeast of the airport. The glider was equipped with a FLARM, which is an onboard collision avoidance system that recorded the glider's flight track, altitude, groundspeed, and engine noise level (ENL). The ENL value increased during the last 4 minutes of flight and then began to fluctuate during the last 13 seconds, both of which are indicative of engine use. FLARM data that were sent to a ground station indicated that, about 11 seconds before impact, the glider entered a left descending turn about 560 ft above ground level; the turn continued until just before impact. The FLARM data could not be correlated with the glider's airspeed, thus the glider's airspeed during the turn could not be determined.

Witness marks on the ground and the structural damage observed at the scene indicated that the glider impacted the ground with the left wingtip immediately followed by the left wing, the engine and propeller, and cockpit. The upward and aft crushing damage was consistent with the glider impacting the terrain in a steep nose down attitude, characteristic of a low-altitude aerodynamic stall. Examination of the airframe and engine revealed no evidence of preimpact anomalies that would have precluded normal operation.

The accident pilot had purchased the glider several months before the accident. Although he had logged

over 1,300 hours of flight experience in gliders , the pilot had logged less than 10 hours in the accident glider.

Based on the impact damage, it is likely that during the left descending turn, after the last recorded data from the FLARM, the airplane pitch exceeded the critical angle of attack resulting in an aerodynamic stall causing the glider to descend to the ground in a steep nose down pitch attitude.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's exceedance of the glider's critical angle of attack during a low-altitude turn, which resulted in an aerodynamic stall and subsequent impact with terrain.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Angle of attack - Not attained/maintained

Factual Information

History of Flight

Maneuvering	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

This section was modified on 11/4/2019. Please see the public docket for this accident to view the original text.

On July 10, 2018, about 1507 mountain daylight time, a Schempp-Hirth Flugzenbau GMBH Ventus 3F motorglider, N753R, impacted terrain 1/2 mile southeast of Moriarty Municipal Airport (0E0), Moriarty, New Mexico. The private pilot sustained fatal injuries and the glider was substantially damaged. The glider was privately owned and was being operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight, which originated from 0E0 about 1312.

The 0E0 airport manager reported that the accident pilot had purchased the accident glider in March. Another glider pilot flying in the vicinity of 0E0 around the time of the accident reported that he departed before the accident pilot and proceeded south. The airport manager said the accident pilot received an aerotow shortly after 1300; the other glider pilot reported that he heard the accident pilot broadcast over the radio that he was not getting any lift and was going to stay near the airport.

A witness on the ground reported that she saw the accident glider as she was driving near the airport. The glider was in a nose-down attitude and very close to the ground. She stated it was odd to see the glider so close to the ground and thought that maybe it was going to land. She then turned her car and lost sight of the glider. The accident pilot's wife called the airport manager about 1700 looking for the accident pilot; a search was initiated shortly thereafter. The glider was subsequently located in a field southeast of the airport.

The glider was equipped with an onboard collision avoidance system called a FLARM, which recorded the glider's flight track, altitude, groundspeed, and engine noise level (ENL). Per the manufacturer, the ENL sensor records high and low frequency noise generated by the engine when rpm is increased and decreased. The noise frequency is depicted as an ENL value. The ENL averaged 50 hertz (Hz) until the last 4 minutes of the flight, when it increased to an average of 170 Hz. About 13 seconds before the FLARM recording ended, the ENL increased to 253 Hz then began to fluctuate. About 1 second before the end of the recording, the ENL values was 63 Hz and the last recorded value was 156 Hz. FLARM information can be received by FLARM devices on other gliders or ground stations. The airport manager had a ground-based FLARM that captured the glider's ground track. The data was processed by an imaging software company and showed that about 11 seconds before impact, the glider entered a left descending turn at a groundspeed of 68 kts and an altitude about 560 ft agl. The left turn continued about 190°, decreasing in diameter to the end of the flight track. Calculations made from the glider FLARM data showed an average groundspeed of 30 kts throughout the flight.

Pilot Information

Certificate:	Private	**Age:**	65,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	Glider	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	None None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	October 1, 2016
Flight Time:	1332 hours (Total, all aircraft), 8.5 hours (Total, this make and model), 8.1 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 1.1 hours (Last 24 hours, all aircraft)		

The pilot, age 65, held a private pilot certificate with ratings for airplane single-engine land and glider. The pilot did not hold a Federal Aviation Administration medical certificate; no medical certificate is required to operate a glider as pilot-in-command.

Review of the pilot's logbook indicated that the pilot had about 1,332 total hours of flight experience in gliders. He had logged about 8.5 hours in the accident glider make and model. His most recent flight review was completed on October 1, 2016.

The pilot's wife reported that her husband was very safe and was always prepared to fly. He always used a checklist. She said that he was in good spirits and there were no personal conflicts or issues that would have distracted him from concentrating on flying. She also stated that he was taking no medications at the time and that his health was good.

The airport manager reported that, during a flight 5 months earlier, the pilot experienced some controllability problems with the accident glider and landed the glider off-airport in a field. The pilot said that he might have had a weight and balance issue with the glider, but later determined that the center of gravity was within limits. The manager described the pilot as a conscientious and conservative pilot and stated that he was experienced.

Another glider pilot reported that the pilot never went far from the airport in this glider and that he rarely flew more than 50 kilometers from 0E0, having difficulty working the lift. He felt that the accident pilot was intimidated by the glider and that he didn't like to bank steeply.

Aircraft and Owner/Operator Information

Aircraft Make:	SCHEMPP-HIRTH FLUGZEUGBAU GMBH	**Registration:**	N753R
Model/Series:	VENTUS 3F	**Aircraft Category:**	Glider
Year of Manufacture:	2017	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	017FS
Landing Gear Type:	Tandem	**Seats:**	1
Date/Type of Last Inspection:	March 21, 2018 Annual	**Certified Max Gross Wt.:**	1323 lbs
Time Since Last Inspection:	8 Hrs	**Engines:**	Electric
Airframe Total Time:		**Engine Manufacturer:**	FES
ELT:		**Engine Model/Series:**	M100
Registered Owner:	On file	**Rated Power:**	45 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The single-seat, low-wing, single retractable landing gear motorglider, serial number 017FS, was manufactured in 2017 and placed in service on January 10, 2018. It was issued a special airworthiness certificate that placed it in the experimental-exhibition category. The glider was approved for flight in day visual meteorological conditions. According to the airframe logbook, the glider had 8.5 total hours before the accident flight.

The glider was equipped with a single-shaft, 22-kilowatt (maximum power) FES-DIS-M100 front electric sustainer (FES) engine, serial number 010, which powered a FES-VEN-P14-102, 28-inch diameter, two-bladed propeller. The engine was powered by two 116-volt batteries located behind the cockpit. A main avionics switch provided power from the batteries to the engine. A toggle power switch was used to turn the engine on and off. A throttle knob on the engine control unit controlled the propeller speed. The foldable propeller was located at the nose of the glider; when not in use, the blades folded aft against the fuselage.

Per the glider flight manual, the glider's normal operating airspeed range was 51 to 103 kts. Its never-exceed airspeed in smooth air was 151 kts. At the first indication of a stall, a vibration in the flight controls occurred about 3 kts above stall speed. Stall recovery required releasing the control stick firmly forward, and if necessary, applying opposite rudder and aileron. The altitude loss between the beginning of a stall and recovery to normal flight was about 262 ft.

The glider was equipped with an LXNav LX9000 glide computer/GPS unit; no data could be obtained as the unit was missing its internal SD card.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	ABQ,5355 ft msl	**Distance from Accident Site:**	30 Nautical Miles
Observation Time:	13:52 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Few / 11000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.36 inches Hg	**Temperature/Dew Point:**	22°C / 12°C
Precipitation and Obscuration:			
Departure Point:	Moriarty, NM (0E0)	**Type of Flight Plan Filed:**	None
Destination:	Moriarty, NM (0E0)	**Type of Clearance:**	None
Departure Time:	13:12 Local	**Type of Airspace:**	Class D

The 1352 recorded weather information from the Albuquerque International Sunport Airport (ABQ), Albuquerque, New Mexico, automated weather observation station, 30 miles west of the accident site, included calm wind, 10 miles visibility, few clouds at 11,000 ft agl, few clouds at 25,000 ft agl, temperature 72°F, dew point 54°F, and altimeter setting of 30.36 inches of mercury.

Airport Information

Airport:	Moriarty Municipal Airport 0E0	**Runway Surface Type:**	
Airport Elevation:	6200 ft msl	**Runway Surface Condition:**	Rough;Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

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:**	34.978054,-106(est)

The wreckage was located in a rough prairie field, 0.5 mile from the departure end of runway 26 at 0E0 at an elevation about 6,200 ft mean sea level. The wreckage was contained in an area that was 90 ft long and 40 ft wide.

The initial impact point was identified as a 27-ft-long, 6-inch-wide ground scar that extended east-northeast and ended at a 12-ft-long, 12-ft-wide, and 8-inch-deep impact crater. About 6 ft from the start of the ground scar was the left winglet, which had broken aft. White paint chips and pieces of the left wing leading edge were located in and along the ground scar. White paint smears were located in the compressed ground at the start of the ground scar.

Pieces of the forward fuselage, canopy frame, broken Plexiglas, flight instruments, one of the two propeller blades, and the tip from the other blade were located in the impact crater. The one intact propeller blade was broken aft at its base where it joined the propeller hub. The blade showed chordwise rubs and scratches.

Extending eastward from the impact crater was a 30-ft-long, 45-ft-wide debris field that contained additional fragmented pieces of clear Plexiglas, additional pieces from the canopy frame, trailing edge pieces from both ailerons, and the right winglet and wingtip wheel.

The main wreckage was oriented on a 226° heading and was located at the east edge of the debris field on a shallow ridge. The wreckage began with the remainder of the cockpit area, including pieces of the instrument panel, seat, fuselage, the flight control mixer, rudder pedals, control stick, spoilers lever, main landing gear, the electric engine with the remainder of one propeller blade, and the batteries. The forward part of the cockpit and engine were crushed upward and aft about 60° and left about 15°.

The left and right wings were broken aft at the wing roots and turned over on top of the aft fuselage. Both left and right wings were fractured aft in three locations.

The aft fuselage was broken in three locations. The two fuselage sections and the vertical stabilizer were held together by the push-pull tube to the elevators. The empennage comprised the vertical stabilizer, rudder, the horizontal stabilizer and elevators, and the tailwheel. Part of the trailing edge of the right elevator was broken; the remainder of the empennage was intact.

Flight control continuity was established from the flight control surfaces to the cockpit controls. Continuity was also established from the spoiler lever to the spoilers.

An examination of the FES-DIS-M100 electric flight sustaining engine showed no preimpact anomalies.

Medical and Pathological Information

An autopsy was performed on the pilot by the New Mexico State Medical Laboratory, Albuquerque, New Mexico. The cause of death was listed as blunt force trauma.

Forensic toxicology was performed on specimens from the pilot by the FAA's Forensic Sciences Laboratory. Results were negative for tested-for drugs. Although 22 (mg/dL) ethanol was detected in muscle tissue, none was detected in liver; this finding is consistent with post-mortem production.

Administrative Information

Investigator In Charge (IIC):	Bowling, David
Additional Participating Persons:	Steve J Poiani; Federal Aviation Administration; Albuquerque, NM Ken Hand; Federal Aviation Administration; Albuquerque, NM
Original Publish Date:	November 6, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97731