Aviation Investigation Final Report

Location:	Micanopy, Florida	**Accident Number:**	ERA17FA145
Date & Time:	April 4, 2017, 09:08 Local	**Registration:**	N155CL
Aircraft:	Pipistrel Virus SW	**Aircraft Damage:**	Destroyed
Defining Event:	Windshear or thunderstorm	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Although the airline transport pilot received preflight weather briefings that forecast a risk of severe thunderstorms along his route, he chose to depart on an instrument flight rules (IFR) cross-country flight in his motorglider. About 45 minutes after departure, he asked air traffic control for any pilot reports or other information about the line of weather, which was located to the north along his route. The controller advised that there were areas of heavy-to-extreme precipitation and offered to provide vectors through the area of least precipitation when the pilot arrived in the vicinity. The pilot acknowledged and advised the controller that he would divert to another airport south of the weather if the conditions deteriorated. The controller continued to provide vectors and inform the pilot of the location and severity of the precipitation as the airplane continued north. About 10 miles south of the line of weather, the controller issued a slight left turn to avoid an area of heavy to extreme precipitation. The pilot advised that he saw an area to his right that looked like a viable route, and after discussion with the controller, chose to navigate around the weather on his own. When the controller checked in with the pilot a few minutes later, the pilot said that his ride was smooth, and he could see some lightning to his right. He then indicated that he had entered the clouds and could no longer deviate around weather visually. No further transmissions were received from the pilot, and radar contact was lost about 2 minutes later.

The motorglider was highly fragmented at the accident site and was mostly confined to a small area about 75 ft in diameter. A large section of the left wing and the left flaperon were found in two separate locations about 4.5 and 3.5 miles away from the main wreckage, respectively, consistent with an in-flight breakup. Examination of the airframe and engine revealed no anomalies that would have precluded normal operation.

A review of available weather information revealed that the pilot likely encountered a severe rotating thunderstorm (supercell), with associated hazards such as severe wind shear, updrafts and downdrafts, hail, lightning, icing, and possible tornado activity.

The motorglider was not equipped for flight in instrument meteorological conditions (IMC) and the flight manual specifically prohibited flying according to instrument flight rules, in IMC, in heavy

rainfall, or during thunderstorm activity. Despite the weather information provided to him before the flight, the pilot chose to depart toward and continue into the area of severe convective activity. The violent conditions associated with the supercell thunderstorm exceeded the motorglider's design stress limitations and resulted in an in-flight breakup.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's intentional flight into an area of known convective thunderstorm activity, which resulted in an in-flight breakup.

Findings

Personnel issues	Decision making/judgment - Pilot
Aircraft	(general) - Capability exceeded
Environmental issues	(general) - Effect on equipment
Environmental issues	(general) - Decision related to condition
Environmental issues	(general) - Compliance w/ procedure

Factual Information

History of Flight

Enroute-cruise	Windshear or thunderstorm (Defining event)
Enroute-cruise	Aircraft structural failure
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On April 4, 2017, about 0908 eastern daylight time, an experimental Pipistrel Virus SW motorglider, N155CL, was destroyed when it impacted terrain in Micanopy, Florida. The airline transport pilot was fatally injured. The motorglider was privately owned and operated as a Title 14 Code of Federal Regulations Part 91 personal flight. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the flight, which departed Sebring Regional Airport (SEF), Sebring, Florida, at 0800, destined for Oconee County Regional Airport (CEU), Clemson, South Carolina.

Radar data provided by the Federal Aviation Administration (FAA) revealed that the motorglider was on a northerly track from SEF about 8,000 ft mean sea level (msl). At 0842, the pilot contacted the Jacksonville approach control facility and asked for pilot reports and information about the line of weather about 60 nautical miles to the north along his route. The controller described the location and movement of areas of "heavy to extreme precipitation" and offered to provide vectors through the area of least precipitation when the pilot neared the line of weather. The pilot inquired about the height of the cloud bases in the area of the weather, and the controller advised of a pilot report about 30 minutes old that indicated cloud bases at 10,000 ft. The pilot acknowledged, and said, "if things turn south I'll just go to Ocala." The controller confirmed that Ocala International Airport (OCF), located about 20 miles south of the line of weather, would be the pilot's alternate destination.

About 10 minutes later, the controller provided a heading of 320° to avoid an area of extreme precipitation about 30 miles ahead of the motorglider and advised the pilot to expect that heading for about 35 miles before proceeding back on course, which the pilot acknowledged. About 5 minutes later, at 0857, as the motorglider was passing OCF, the pilot asked the controller if the weather around which he was currently deviating was south of OCF. The controller stated that the "heavy and extreme precipitation" was over and extending south of Gainesville Regional Airport (GNV, about 31 nautical miles north of OCF), was moving east and that there was "a hole" behind it about 25 miles west of GNV, which she was vectoring the pilot toward. She then provided a new heading of 310° and advised the pilot to expect to remain on that heading for about 25 miles, then to expect a northeast turn "through the precip." The pilot acknowledged.

At 0902, the controller issued the pilot a 10° left turn to avoid an area of "heavy to extreme precipitation." The pilot asked the controller to confirm that the turn was to the left, and advised that he saw an area about 40° to the right that looked like he get could get "through there." The controller asked the pilot if he would like to remain on radar vectors or to deviate as necessary on his own to navigate around the weather. After the controller explained that her display did not present the altitude of the precipitation or any "buildups," the pilot chose to navigate on his own.

At 0906, the controller asked the pilot, "how's it looking?" The pilot responded, "so far its uh, its pretty much smooth, there's some lightning off to my right and uh [unintelligible] it's gonna be okay." The controller acknowledged, and the pilot continued, "I did just go into the clouds though, so I can't pick anymore." The controller acknowledged. There were no further radio transmissions from the pilot. At 0907:28, the controller began a series of attempts to contact the pilot but was unsuccessful. At 0908:36, she advised that radar contact was lost.

A witness located at his residence about 200 yards from the accident site reported that he had been outside in the pasture when it started to rain. He went inside his house and 3 to 5 minutes later, he heard an airplane engine. He indicated that the engine sound was smooth and continuous and sounded as though the aircraft flew over his house. The engine noise abruptly stopped, followed by "a loud pop sound, similar to a lightning crack." He looked outside and saw the motorglider in the pasture and asked his wife to call 911.

Radar returns from the motorglider ended at the edge of an east-west oriented line of severe thunderstorms, rain showers, and lightning that extended about 100 nautical miles to either side of the motorglider's radar flight track, according to National Weather Service (NWS) weather radar data. (See figure 1.)

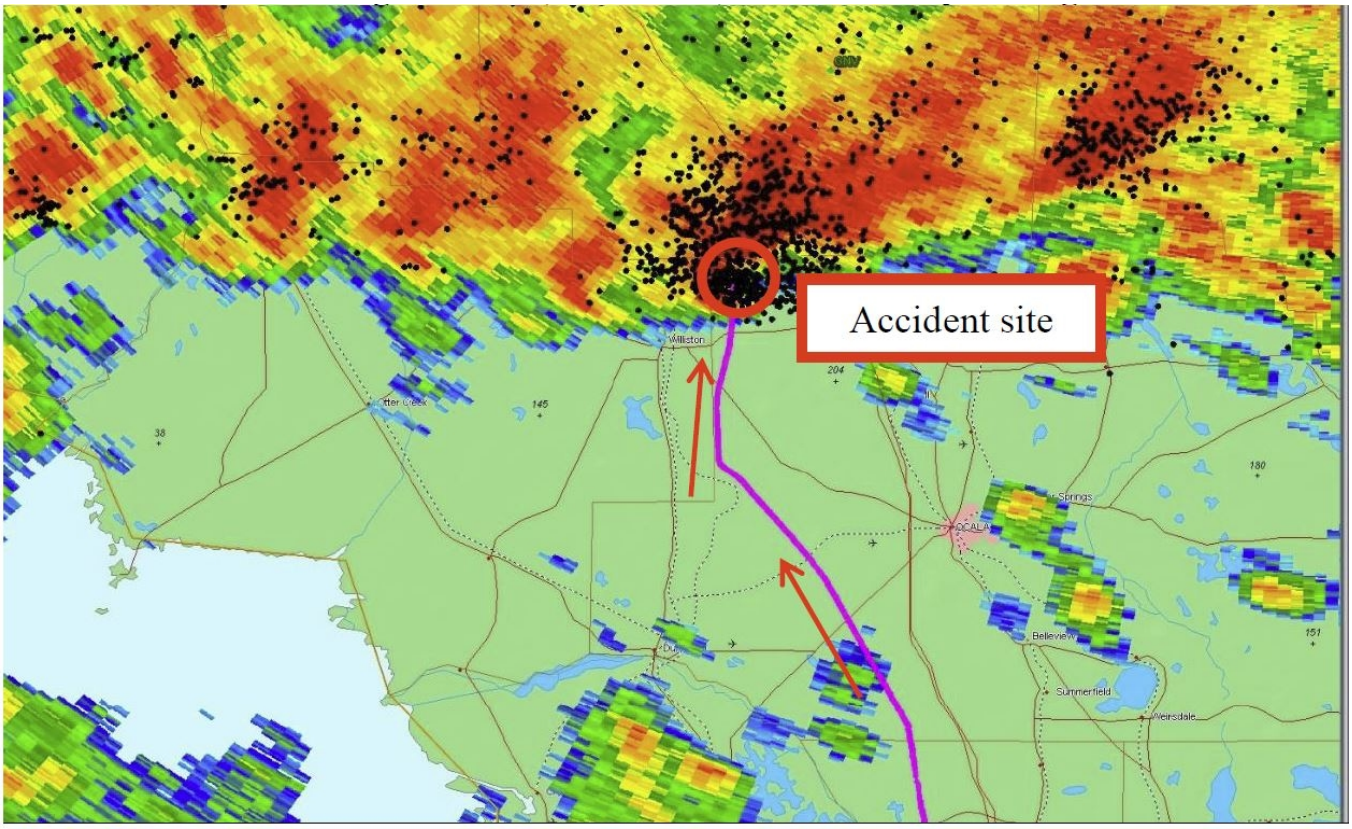

Figure 1 - KJAX WSR-88D reflectivity for the 0.5° elevation scan initiated at 0911 EDT

Pilot Information

Certificate:	Airline transport	**Age:**	64,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Glider	**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:**	October 28, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 12192 hours (Total, all aircraft), 92 hours (Total, this make and model), 51 hours (Last 90 days, all aircraft), 26 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

According FAA records, the pilot held an airline transport pilot certificate with a rating for multiengine land, with private pilot privileges for airplane single-engine land, airplane single-engine sea, and glider. His most recent FAA third-class medical certificate was issued October 28, 2013; on the application for that certificate, he reported 12,100 total hours of flight experience. A review of the pilot's logbook revealed that he had accrued 92 total hours of flight experience in the accident aircraft as of April 2, 2017.

Aircraft and Owner/Operator Information

Aircraft Make:	Pipistrel	**Registration:**	N155CL
Model/Series:	Virus SW	**Aircraft Category:**	Glider
Year of Manufacture:	2016	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	817 SWN 100
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	April 2, 2017 100 hour	**Certified Max Gross Wt.:**	1320 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	89 Hrs as of last inspection	**Engine Manufacturer:**	Rotax
ELT:	Not installed	**Engine Model/Series:**	912 ULS2
Registered Owner:	On file	**Rated Power:**	100 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The accident aircraft was a two-seat, high-wing motorglider with a T-tail empennage and fixed, tricycle landing gear configuration. It was powered by a 100-horsepower Rotax 912 ULS engine driving a three-

bladed composite propeller.

The flight manual stated:

Due to flight safety reasons, it is forbidden to:
fly according to instrument flight rules or in instrument meteorological conditions
fly in heavy rainfalls
fly during thunderstorm activity

According to the flight manual, the Virus SW was certified as a "Microlight/Ultralight aircraft." According to an FAA Advisory Circular, this model met criteria to be registered as a "glider" (which includes powered gliders) based on its maximum weight, seating capacity, and wing loading; because it was registered as a glider, the pilot was not required to have a valid medical certificate.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	GNV,123 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	08:53 Local	**Direction from Accident Site:**	21°
Lowest Cloud Condition:		**Visibility**	5 miles
Lowest Ceiling:	Broken / 4300 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / 18 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	100°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.93 inches Hg	**Temperature/Dew Point:**	19°C / 18°C
Precipitation and Obscuration:	Moderate - Thunderstorm - Rain		
Departure Point:	SEBRING, FL (SEF)	**Type of Flight Plan Filed:**	IFR
Destination:	CLEMSON, SC (CEU)	**Type of Clearance:**	IFR
Departure Time:	08:00 Local	**Type of Airspace:**	

At 0853, the reported weather at GNV, about 15 nautical miles north of the accident site, included thunderstorms, moderate rain, mist, and wind from 100° at 10 knots gusting to 18 knots. The ceiling was broken at 4,300 ft above ground level (agl) and overcast at 7,500 ft agl. Visibility was 5 statute miles, the temperature was 19°C, and the dew point was 18°C. A peak wind gust to 30 knots was observed at 0803.

Weather radar imagery and lightning data depicted heavy to extreme echoes (precipitation) at the accident location with convective cells and lightning. The echoes were consistent with the possibility of hail, extreme turbulence, and strong surface wind gusts. Radar velocity data indicated winds conducive to rotation above the accident site at the time of the accident, with the potential for tornadic activity at the surface. The area of heavy to extreme precipitation stretched across the entire width of northern Florida between 0845 and 0915.

The National Weather Service (NWS) Aviation Weather Center issued convective SIGMETs for the

accident site and surrounding area as early as 0555. One SIGMET issued at 0755 warned of severe thunderstorms with tops above 45,000 ft msl and wind gusts up to 50 knots. The NWS also issued a severe thunderstorm warning at 0900 and a tornado warning at 0910 for areas including the accident location.

A post-accident upper air model sounding was created for the accident site. The model indicated a conditionally unstable environment that would have been supportive of cloud formation, rain showers, and thunderstorms.

The pilot received several official weather briefings in text format from Lockheed Martin Flight Service, the Direct Access User Terminal Service, and Leidos on the day before and the morning of the accident. These materials included the standard weather conditions and forecasts as well as the active SIGMETS and severe thunderstorm warnings valid along the route of flight.

The motorglider was equipped with an electronic display that had the capability to receive and display NEXRAD radar images through the Automatic Dependent Surveillance - Broadcast (ADS-B) radio system. Whether the pilot had activated or was using this feature could not be determined.

A detailed Meteorology Factual Report is available in the public docket.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	29.465278,-82.375(est)

The motorglider impacted a grass pasture in an approximate 90° nose-down attitude. All major components were accounted for at the scene, except the left wing and flaperon and one of the propeller blades. The main wreckage was fragmented and confined to an area about 75 ft in diameter, a majority of which was within a wingspan to either side of the engine. The empennage was separated from the aft fuselage. The rudder and horizontal stabilizer were separated from the vertical stabilizer. Flight control continuity was established from the rudder pedals to the rudder control horn, which was separated from the rudder. Flaperon and elevator control continuity could not be confirmed due to impact damage.

The engine was buried about 3 ft in the initial impact crater. All three carbon fiber propeller blades were fractured at or near their root. One of the blades was not located. The gearbox and propeller hub were separated from the engine crankcase. The crankshaft could not be rotated due to impingement with damaged engine mounts and external components.

A large section of the left wing was located on a farm about 4.5 miles south of the main wreckage. The left flaperon was located about 3.5 miles south of the accident site about 1 month after the accident.

A Dynon SkyView SV-D700 electronic flight instrument system was recovered from the accident site and forwarded to the NTSB Vehicle Recorder laboratory for examination. The unit was severely damaged and no data were recoverable from the internal memory devices.

Medical and Pathological Information

Postmortem examination of the pilot was performed by the District 5 Medical Examiner's Office, Leesburg, Florida. The cause of death was listed as multiple blunt force injuries.

Forensic toxicology was performed on specimens of the pilot by the FAA Forensic Sciences Laboratory and by the Wuestoff Reference Laboratory, Melbourne, Florida. The report from the FAA indicated that Flecainide (an antiarrhythmic drug) and Loratadine (a non-sedating antihistamine) were both detected in muscle and liver, with no concentrations specified. Neither of these drugs are considered to be impairing. Ethanol was detected in muscle at 11 mg/dL, consistent with postmortem production. The report from the Wuestoff laboratory was negative for all screened drugs.

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass
Additional Participating Persons:	Robert Gonzalez; FAA/FSDO; Orlando, FL
Original Publish Date:	December 16, 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=94959