# Aviation Investigation Final Report

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| **Location:** | Channahon, Illinois | **Accident Number:** | CEN16FA308 |
| **Date & Time:** | August 6, 2016, 15:33 Local | **Registration:** | N551DR |
| **Aircraft:** | PZL-BIELSKO SZD 55-1 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Loss of control in flight | **Injuries:** | 1 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The single-seat glider, flown by a private pilot, was being towed into the air by a tow airplane. During the takeoff ground run, the glider's right wing dropped and contacted the ground after the wing-runner let go of the right wing. The wings leveled momentarily, and then the left wing contacted the ground while the glider was veering slightly to the left. The pilot again leveled the wings briefly before the glider pitched up about 30° to 40° and became airborne. The tow airplane was still on its takeoff ground run when the glider pitched-up. As the glider climbed in a 30° to 40° nose-up attitude, the tow airplane took off, and, shortly thereafter, the glider released from the towline. The glider's pitch attitude leveled out, and it briefly entered a right turn before it entered an aerodynamic stall/spin about 150 ft above the ground. The tow airplane subsequently landed uneventfully with the towline still attached to its tail clasp mechanism.

A postaccident examination of the glider's airframe revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. The complete span of towline and tow ring remained attached to the tow airplane and appeared undamaged, consistent with the glider pilot having intentionally released the towline. There was no evidence of a medical condition or substance use that contributed to the accident. The pilot likely was distracted by the wings contacting the ground during the takeoff run and allowed the glider to pitch-up into a rapid climb. After the pilot released the glider from the towline, he likely did not recognize that the glider was approaching stall speed and allowed the glider to exceed its critical angle of attack, which resulted in an aerodynamic stall at a low altitude.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The glider pilot's failure to maintain adequate pitch control while being towed and his subsequent failure to maintain adequate airspeed control after releasing from the towline, which resulted in the glider

exceeding its critical angle of attack and an aerodynamic stall/spin at a low altitude.

## Findings

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| **Aircraft** | Pitch control - Not attained/maintained |
| **Aircraft** | Airspeed - Not attained/maintained |
| **Aircraft** | Angle of attack - Not attained/maintained |
| **Personnel issues** | Incorrect action performance - Pilot |

# Factual Information

## History of Flight

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| **Initial climb** | Loss of control in flight (Defining event) |
| **Initial climb** | Aerodynamic stall/spin |

HISTORY OF FLIGHT

On August 6, 2016, about 1533 central daylight time, an experimental PZL Bielsko SZD 55-1 glider, N551DR, collided with terrain shortly after takeoff from Chicago Glider Club Gliderport (IL59), Channahon, Illinois. The pilot was fatally injured, and the glider was substantially damaged. The glider was owned and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which was not on a flight plan. The local flight was departing at the time of the accident.

The pilot of the tow airplane reported that he initiated the takeoff from runway 27, a 2,000-ft-long grass runway, and that the takeoff ground run was normal. The tow airplane lifted-off about halfway down the runway and began climbing. He stated that, when the tow airplane was about 20 ft above ground level (agl), he began to feel a "heavy increasing drag from the glider and shortly thereafter, felt the glider release from the tow." The tow airplane subsequently landed uneventfully with the towline still attached to its tail clasp mechanism.

Three witnesses reported that, during the takeoff roll, the glider's right wing dropped and contacted the ground after the wing-runner let go of the right wing. The wings leveled momentarily, and then the left wing contacted the ground while the glider was veering slightly to the left. The witnesses stated that the glider pilot then leveled the wings briefly before the glider pitched-up about 30° to 40°. The tow airplane was still on its takeoff ground run when the glider pitched-up. The glider continued to climb in a 30°- to 40°-pitch attitude until the towline released from the glider, which was then on a southwest heading. The glider's pitch attitude subsequently leveled out, and it appeared that the glider briefly began a right turn before it entered an aerodynamic stall/spin to the left. The witnesses stated that the glider had reached 100 to 200 ft agl when it entered the aerodynamic stall/spin.

Data downloaded from an LX 7007 Pro Image flight recorder that was recovered from the glider indicated that, at 1533:03, the glider achieved its highest recorded altitude of 152 ft agl at a ground speed of 45.5 mph and a climb rate of 1,650 feet per minute (fpm). About 7 seconds later, the glider impacted the terrain while descending at 870 fpm. For further details about the data recorded by the LX7007 during the accident flight, see the Tests and Research section later in this report.

PERSONNEL INFORMATION

The 69-year-old glider pilot held a private pilot certificate with ratings for single-engine land airplanes, single-engine sea airplanes, and gliders. He also held an airplane instrument rating. His most recent second-class airman medical certificate was issued on November 3, 2015, with the restriction to have

glasses available for near vision. During his medical examination, the pilot reported a total flight time of 1,810 hours. The pilot had an estimated 112 hours of flight time in gliders.

The pilot purchased the glider in April 2016. The pilot's logbook indicated that he flew the glider 5.7 hours between May 3, 2016, and May 18, 2016. There were no additional flights logged in the accident glider between May 18, 2016, and the day of the accident; however, the logbook indicated that the pilot flew other gliders for 2.1 hours between July 7, 2016, and July 11, 2016. According to the on-board LX 7007 Pro Image flight recorder, the pilot flew the accident glider for 50 minutes earlier on the day of the accident.

## AIRCRAFT INFORMATION

The single-seat glider, serial number 551192039, was manufactured in 1992. The glider's maximum gross weight was 1,102 pounds. The last condition inspection was conducted on April 1, 2016, when the glider had a total time of 930 hours. The glider's flight logbook indicated that the glider had a total time of 937.1 hours when the previous owner sold it to the accident pilot in April 2016.

## METEOROLOGICAL INFORMATON

At 1535, about 2 minutes after the accident, the surface weather observation at the Joliet Regional Airport, Joliet, Illinois, located about 6 miles northeast of the accident site, reported the surface wind 330° at 6 knots, a clear sky, 10 miles surface visibility, temperature 29°C, dew point 16°C, and altimeter 29.97 inches of mercury.

## WRECKAGE AND IMPACT INFORMATION

The glider impacted a field with tall grass about 200 ft south and 1,600 ft from the approach end of runway 27. The impact damage was consistent with the glider impacting in a left-wing-low, steep nose-down attitude. The entire aircraft was located at the point of impact. The entire span of the left wing remained attached to the fuselage, and the outboard section of the wing exhibited crushing and impact damage along the leading edge. The nose and cockpit remained attached to the fuselage; however, they were crushed, broken, and displaced to the right. The pilot's seatback was displaced during the impact. It was not possible to determine where the seatback was positioned before impact. The pilot's parachute was in the cockpit and had not been deployed.

The outboard section of the right wing was separated at the aileron bellcrank and was lying forward of the inboard section of the wing in the direction of travel. The tail was broken aft of the fuselage, and the tail boom and empennage were displaced to the right of the fuselage. The empennage remained intact and exhibited no damage. The wing and horizontal stabilizer attach points were attached properly and were secure.

The flight controls, including the spoilers, were checked for continuity from the flight controls to their respective surfaces. Flight control cables and control tubes were traced, and all breaks were consistent with overstress separations. No preimpact flight control continuity anomalies were detected. The ballast tanks did not contain any water. The towline release mechanism was found in the spring-loaded closed position. The release lever was operated by hand, and it moved to the tow release position. The complete span of towline and the tow ring remained attached to the tow airplane and appeared undamaged.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Will County Coroner's Office, Crest Hill, Illinois, conducted an autopsy of the pilot. The cause of death was multiple injuries.

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing on the pilot. No carbon monoxide was detected in the blood. The test for cyanide was not performed. No ethanol was detected in the vitreous. Quinine was detected in the blood and urine. Rosuvastatin was detected in the urine but not in the blood.

Rosuvastatin is a medication used to treat high cholesterol. Quinine is used to treat malaria and is found in tonic water. Neither of these drugs is impairing.

## TESTS AND RESEARCH

The SZD-55-1 Flight Manual in Section 4.9.1, "Stalling and characteristic airspeed IAS," indicated that the stall speed for a light pilot without water ballast is 39.1 mph in straight flight and 46.5 mph when circling with a 45° bank angle.

The LX 7007 Pro Image flight recorder captured data at a rate of once every 4 seconds while in flight. The flight track data provided the following information about the glider's performance:

| Time | Ground Speed | Altitude | Rate of climb or descent (fpm) |
|---|---|---|---|
| 15:32:41 | 00 mph | [585'] | |
| 15:32:43 | 02 mph | [585'] | |
| 15:32:45 | 07 mph | [585'] | |
| 15:32:47 | 16 mph | [585'] | |
| 15:32:51 | 32.5 mph | [590'] | |
| 15:32:55 | 47 mph | [595'] | |
| 15:32:59 | 55 mph | [632'] | [555 fpm] |
| 15:33:03 | 45.5 mph | [742'] | [1650 fpm] |
| 15:33:07 | 40 mph | [728'] | [-210 fpm] |
| 15:33:10 | 00 mph | [670'] | [-870 fpm] |

## ADDITIONAL INFORMATION

The glider flight instructor who provided flight training to the pilot in 2002 when the pilot was new to flying gliders aided the NTSB during the on-site investigation. He knew the pilot personally and was familiar with the pilot's glider experience. He reported that the pilot was about 6 ft 1 inches tall and had a sleeve length of about 41 inches. He stated that the pilot likely had the seatback set at an aft location due to his height and the fact that he was wearing a parachute during the flight. He stated that, if the seatback had accidently fallen rearward, the back would have traveled only about 2 inches aft; this would not have restricted the pilot's full access to the cockpit flight controls.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 69,Male |
| **Airplane Rating(s):** | Single-engine land; Single-engine sea | **Seat Occupied:** | Single |
| **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 Without waivers/limitations | **Last FAA Medical Exam:** | November 3, 2015 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | (Estimated) 1810 hours (Total, all aircraft), 112 hours (Total, this make and model) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | PZL-BIELSKO | **Registration:** | N551DR |
| **Model/Series:** | SZD 55-1 | **Aircraft Category:** | Glider |
| **Year of Manufacture:** | 1992 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Experimental (Special) | **Serial Number:** | 551192039 |
| **Landing Gear Type:** | Hull | **Seats:** | 1 |
| **Date/Type of Last Inspection:** | April 1, 2016 Condition | **Certified Max Gross Wt.:** | 1102 lbs |
| **Time Since Last Inspection:** | | **Engines:** | |
| **Airframe Total Time:** | 926.5 Hrs as of last inspection | **Engine Manufacturer:** | |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | |
| **Registered Owner:** | On file | **Rated Power:** | |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | JOT,582 ft msl | **Distance from Accident Site:** | 6 Nautical Miles |
| **Observation Time:** | 15:35 Local | **Direction from Accident Site:** | 32° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 6 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 330° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29.96 inches Hg | **Temperature/Dew Point:** | 29°C / 16°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Channahon, IL (IL59) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Channahon, IL (IL59) | **Type of Clearance:** | None |
| **Departure Time:** | 15:32 Local | **Type of Airspace:** | |

## Airport Information

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| **Airport:** | Chicago Glider Club Gliderport IL59 | **Runway Surface Type:** | Grass/turf |
| **Airport Elevation:** | 590 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 27 | **IFR Approach:** | None |
| **Runway Length/Width:** | 2000 ft / 250 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **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:** | 41.430831,-88.249443 |

## Administrative Information

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| **Investigator In Charge (IIC):** | Silliman, James |
| **Additional Participating Persons:** | Kurt Stiefel; FAA DuPage FSDO; Des Plaines, IL |
| **Original Publish Date:** | April 23, 2018 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=93779 |