Aviation Investigation Final Report

Location:	Santa Monica, California	**Accident Number:**	WPR22FA338
Date & Time:	September 8, 2022, 16:26 Local	**Registration:**	N126WK
Aircraft:	CZECH SPORT AIRCRAFT Piper Sport	**Aircraft Damage:**	Destroyed
Defining Event:	Abrupt maneuver	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight was an introductory flight lesson for the passenger in the light-sport airplane. The route was along the Southern California Coast and the flight lasted about 35 minutes. The landing approach was uneventful, with the flight instructor providing clear indications of the airplane's position as they flew in the traffic pattern, and declaring his intention that this would be a full-stop landing. Multiple witnesses observed the airplane land on runway 21, with one describing the landing as "hard."

About the time of landing, a transmission over the common traffic advisory frequency (CTAF), captured a low pitch grunting sound followed by the instructor screaming, "let go, let go……. let go, let go, let go." The grunting sound continued, and the airplane pitched aggressively nose-up and began to climb almost vertically with the engine at a high power level, before leveling off about 100-200 ft above ground level (agl), then spinning to the left, descending, and colliding with the ground.

Most of the airframe was consumed by fire; however, the postaccident examination did not reveal any evidence of preimpact mechanical malfunction or failure of the flight control system. Damage to the propeller blades indicated that the engine was producing power at impact, and the flaps were in a configuration appropriate for landing.

The airplane was equipped dual control sticks, both of which were fitted with push-to-talk (PTT) microphone switches. The instructor's "let go" commands were transmitted over the CTAF and appeared to be coming from the background over the student's microphone; therefore it is likely that the student pilot was holding his stick firmly, and inadvertently pressing the switch.

Federal Aviation Administration (FAA) regulations do not explicitly prohibit students, or in this case a passenger, from manipulating the flight controls during any phase of flight training; however, guidance does warn that students can be anxious learners and can be incredibly strong and often exhibit reactions that are inappropriate to the situation. The flight track indicated that along with routine flight maneuvers, the airplane did perform a series of high-bank-angle turns that would have resulted in high G-forces to the occupants. It is possible that the instructor had established a comfort level with the student after performing those maneuvers that resulted in him gaining a level of trust with the passenger's ability.

It is common for the landing phase to be stressful for a new student, especially as the runway approaches. This stress would be further exacerbated during a hard landing, as was described by a witness. The passenger likely applied excessive aft elevator control, possibly in response to the flight instructor's input, or as a reaction following a hard landing as described by witnesses. Given the responsive flight characteristics of the airplane, this would have resulted in the pitch up motion that exceeded the airplane's critical angle of attack and resulted in an aerodynamic stall as observed by witnesses. Additionally, because the passenger was pressing the PTT switch, the instructor's microphone was blocked and the passenger may not have been able to understand what the instructor was saying.

Probable Cause and Findings

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

The pilot's inability to maintain control of the airplane during the landing flare due to the passenger's excessive control inputs, which resulted in the airplane exceeding its critical angle of attack and entering an aerodynamic stall.

Findings

Aircraft	Pitch control - Incorrect use/operation
Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Capability exceeded
Personnel issues	Aircraft control - Passenger
Personnel issues	Anxiety/panic - Passenger
Personnel issues	Expectation/assumption - Instructor/check pilot

Factual Information

History of Flight

Landing-flare/touchdown	Abrupt maneuver (Defining event)
Landing-flare/touchdown	Loss of control on ground
Initial climb	Loss of control in flight
Uncontrolled descent	Collision with terr/obj (non-CFIT)

History of Flight

On September 8, 2022, about, 1626 Pacific daylight time, a Czech Sport Aircraft, Piper Sport, N126WK, was destroyed when it was involved in an accident in Santa Monica, California. The flight instructor and passenger were fatally injured. The light-sport airplane was operated as a Title 14 *Code of Federal Regulations (CFR)* Part 91 instructional flight.

The flight was an introductory flight lesson for the passenger with a flight school based at the Santa Monica Municipal Airport (SMO).

Automatic dependent surveillance - broadcast (ADS-B) data indicated that the airplane departed from runway 21 at 1551, then flew the runway heading and turned to the west after reaching the Pacific shoreline a few minutes later. The airplane continued to fly west along the coast, at altitudes varying between 600 and 2,775 ft mean sea level (msl). After performing a series of left 180° turns, the airplane reached Malibu. The airplane then turned inland around the Pointe Dume Peninsula, and then east along the coast toward Santa Monica. During the return leg, the airplane performed two 360° steep turn maneuvers, and by 1622, the airplane had joined the right downwind leg for runway 21 at the traffic pattern altitude of 1,200 ft msl.

By the time the airplane had reached the turn for the traffic pattern's base leg, it had climbed to 1,375 ft msl and began to descend, reaching 600 ft once it was established on final about 1.25 miles from the runway threshold.

Multiple witnesses observed the airplane land on runway 21, with one describing the landing as "hard." The witnesses stated that the airplane then began to aggressively pitch up and climb while the engine made a sound consistent with it going to full power. All the witnesses provided similar accounts of the airplane continuing to climb in a nose-up attitude before leveling off at the apex of the climb, about 100-200 ft agl, then spinning to the left, descending, and colliding with the ground.

A security video camera located on the southeast side of the airport, adjacent to the runway 21 threshold, and facing north, captured the final landing approach segment. The video showed

the airplane descending over the runway threshold markings at an altitude of about 25 ft agl and then passing to the left and out of the camera's field of view. A second camera, similarly positioned but facing northwest, captured the other end of the runway threshold markings. As the airplane came into view, the main landing gear was already on the ground and the airplane then began to climb in a slightly nose-up attitude. Over the next three seconds, the airplane pitched up to an almost vertical attitude and climbed out of the camera's field of view (see Figure 1). The shadow of the airplane on the runway surface indicated that it continued to climb for another two seconds before descending and striking the ground about 5 seconds later (see Figure 2).

Figure 1 – Composite video image of pitch-up maneuver.

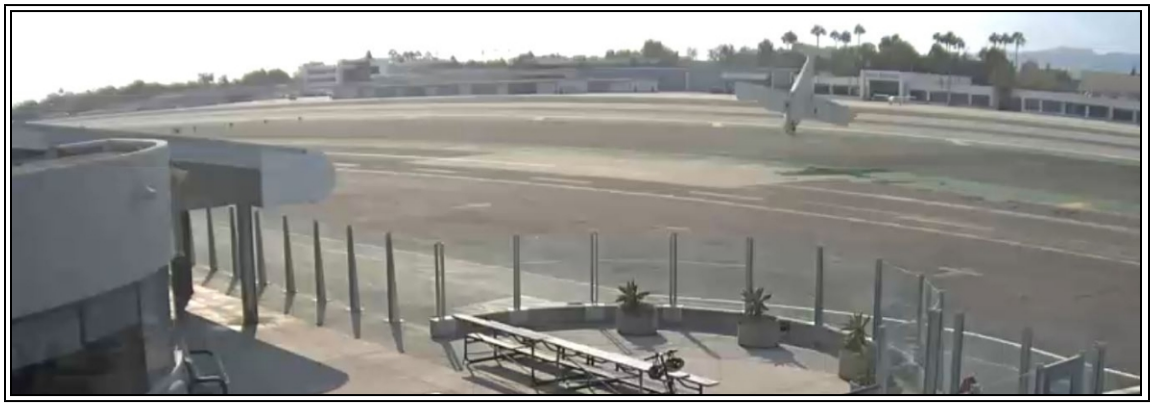

Figure 2 –Video image of the airplane just before impact.

Audio recording of the airport's CTAF captured the airplane's radio transmissions during the landing approach. The flight instructor provided clear indications of the airplane's position as it flew in the traffic pattern, and the tower controller provided the pilot a clearance for "the option" during the landing approach. The flight instructor responded that it was to be a full-stop landing, and a few seconds later the audio captured him screaming, "let go, let go……. let go, let go, let go."

The airplane struck the ground in a nose-down attitude and came to rest at the intersection of taxiway B and B4, about 375 ft south of the runway 21 threshold.

Flight Instructor

The 24-year-old flight instructor held a commercial license with ratings for flight instructor-sport pilot and had been providing instruction with the flight school since 2019. He had about 1,500 hrs of flight experience in the accident model, of which 1,100 hrs were as a flight instructor. According to representatives from the flight school, he was about to become the assistant chief flight instructor.

On his resume, he reported that between 2016 and 2019 he was an open water lifeguard with the City of Los Angeles. At the time of his last FAA medical examination, on June 9, 2022, he was 72 inches tall and weighed 187 lbs.

Passenger

The 28-year-old passenger did not hold a pilot certificate. According to family members, the flight was a gift. They stated that he did not have a specific desire to be a pilot, but that he was adventurous, and this would be an opportunity to try flying. Driver's license records indicated he was 70 inches tall and weighed 160 lbs.

Aircraft and Owner/Operator Information

The airplane was owned and operated by Santa Monica Flyers Inc., a flight school based at SMO that provided aircraft rental along with flight training under the auspices of CFR Part 61.

The airplane was manufactured in 2011 and had been approved for operation in the light-sport aircraft (LSA) category.

It was a two-seat, all-metal design, primarily constructed of aluminum with low wings and a conventional empennage. It was equipped with a 100-horsepower Rotax 912 ULS engine and a 3 blade Sensenich propeller.

The manufacturer marketed the airplane type as having an efficient design, that was well suited for use in flight schools. Aircraft reviews performed by aviation publications described it as responsive and easy to fly, with a takeoff climb rate approaching 1,000 feet per minute. Reviewers noted that the airplane was relatively light/sensitive in pitch during takeoff when compared to the heavier airplanes traditionally operated in flight schools and manufactured to Part 23 standards.

Wreckage and Impact Information

The cabin, inboard wings, and entire tail section were consumed by fire, with only ash remnants of the aft cabin and tail structure remaining.

Examination of the airplane did not reveal any evidence of preimpact mechanical malfunction or failure of the flight control system. The throttle control was found in the full forward position, and two of the three propeller blades exhibited chordwise striations and leading edge nicks. The flaps were at full extension, and the pitch trim servo was consumed by fire, such that the trim position could not be determined.

Additional Information

Review of ADS-B data (Figure 3) indicated that about 10 minutes after takeoff, the airplane began a 180° turn to the left, at a bank angle based on speed and turn radius that would have been between 25° and 30°. About 90 seconds later, the airplane began a more aggressive 180 left turn, this time at a bank angle that would have reached almost 75°. For the next 13 minutes the flight progressed with changes in heading, speed, and bank angle consistent with basic training maneuvers. At 1615:40, the airplane's calibrated airspeed had slowed to about 33 kts, consistent with a practice stall maneuver, and within one minute of completion of the maneuver, the airplane then performed a 360° turn to the left, followed by a 360° turn to the right at bank angles of between 60° and 65°.

Figure 3 – ADS-B flight track

The load factors during a 30°, 60°, and 75° turn are about 1G, 2G, and 3.4G respectively.

Communications

The airplane was equipped with a conventional communication system that included a PS Engineering PM3000 series intercom. A microphone PTT switch was fitted to the top of both the left and right control stick grips. According to the operator, it was not unusual for an inexperienced student to inadvertently hold the top of the control stick where the switch is located.

The intercom was conventional in design, such that both the pilot and copilot had transmit capabilities, and that only the voice of the person who presses their PTT will be transmitted over the radio. The design was such that while the PTT button was pressed by the transmitting pilot, the microphone of the other pilot is disabled. As a feature to assist with flight training, the co-pilot can override the transmission of the pilot by pressing their PTT button.

The student pilot was seated in the pilot seat on the left, and the instructor in the co-pilot seat on the right.

The audio of the “let go” transmission was compared to the instructor’s routine position calls to the control tower. The review appeared to indicate that the “let go” recordings had been captured in the background by the student’s microphone rather than the instructor’s, consistent with the student inadvertently holding down the PTT switch.

Before the instructor’s voice was heard, a low-pitch grunting sound, similar to “ooh ooh” was audible. The sound continued to repeat while the instructor shouted. The recording was analyzed and filtered using audio restoration software in effort to determine its origin. A definitive source could not be determined; however, the sound did not appear mechanical in nature or from outside the cabin.

Medical and Pathological Information

The instructor’s last aviation medical examination was on June 9, 2022. At that time, he reported no active medical issues or medication use. No significant issues were identified during the examination, and he was issued a first-class medical certificate limited by a requirement to wear corrective lenses for near and distant vision.

Autopsies for both occupants were performed by the County of Los Angeles Department of Medical Examiner – Coroner, Los Angeles, California. The cause of death was blunt force traumatic injuries, and no significant natural disease was identified in either case.

The FAA Forensic Sciences Laboratory performed toxicological testing of postmortem specimens from the occupants. In both cases, routine measurements of glucose (sugar) in urine and vitreous were unremarkable, and testing did not detect any other tested-for substances.

According to family members, the passenger was athletic by nature and an active baseball player. They were not aware of any health issues; he had no history of seizures, nor had he

exhibited symptoms of epilepsy, and his stress levels were typical. Review of social media footage posted by the passenger just before the flight indicated that he was happy and in good spirits.

The investigation could not determine if the passenger had a general practitioner, and no medical records for him were located.

Organizational and Management Information

The FAA Aviation Instructor's Handbook provided guidance in understanding and applying the fundamentals of instruction. The handbook recommended developing and using lesson plans and a training syllabus that meet all regulatory certification requirements. Much of the basic planning necessary for a flight instructor was also provided by the knowledge and proficiency requirements published in 14 *CFR* Part 61, along with FAA-approved school syllabi, and various texts, manuals, and training courses.

There are no regulations prohibiting student pilots from manipulating the flight controls during introductory flights. However, the FAA Aviation Instructor's Handbook had a section devoted to "Positive Exchange of Flight Controls," which stated:

"Flight instructors should always guard the controls and be prepared to take control of the aircraft. When necessary, the instructor should take the controls and calmly announce, 'I have the flight controls.' If an instructor allows a learner to remain on the controls, the instructor may not have full and effective control of the aircraft. Anxious learners can be incredibly strong and usually exhibit reactions inappropriate to the situation. If a recovery is necessary, there is absolutely nothing to be gained by having the learner on the controls and having to fight for control of the aircraft. Learners should never be allowed to exceed the flight instructor's limits. Flight instructors should not exceed their own ability to perceive a problem, decide upon a course of action, and physically react within their ability to fly the aircraft."

According to the flight school, before departure, the instructor provided about 1 hour of basic ground instruction to the passenger, using a syllabus that had been tailored for introductory flight lessons, and discussed flight control handoffs between passenger and instructor.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	24,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	June 9, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 26, 2022
Flight Time:	(Estimated) 1500 hours (Total, all aircraft), 1500 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	CZECH SPORT AIRCRAFT	**Registration:**	N126WK
Model/Series:	Piper Sport	**Aircraft Category:**	Airplane
Year of Manufacture:	2011	**Amateur Built:**	
Airworthiness Certificate:	Special light-sport (Special)	**Serial Number:**	P1001093
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	August 11, 2022 100 hour	**Certified Max Gross Wt.:**	1320 lbs
Time Since Last Inspection:	77.7 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	5300.7 Hrs as of last inspection	**Engine Manufacturer:**	ROTAX
ELT:	C126 installed, not activated	**Engine Model/Series:**	912ULS SERIES
Registered Owner:	SANTA MONICA FLYERS INC	**Rated Power:**	100 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSMO,175 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	16:37 Local	**Direction from Accident Site:**	35°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.64 inches Hg	**Temperature/Dew Point:**	32°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Santa Monica, CA (SMO)	**Type of Flight Plan Filed:**	None
Destination:	Santa Monica, CA (SMO)	**Type of Clearance:**	VFR
Departure Time:	15:51 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	SANTA MONICA MUNI SMO	**Runway Surface Type:**	Asphalt
Airport Elevation:	169 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	21	**IFR Approach:**	None
Runway Length/Width:	3500 ft / 150 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	N/A	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	34.017882,-118.44801

Administrative Information

Investigator In Charge (IIC):	Simpson, Eliott
Additional Participating Persons:	Kevin Johnson; Federal Aviation Administration; Los Angeles, CA
Original Publish Date:	July 10, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=105890