Aviation Investigation Final Report

Location:	Stonewall, Texas	**Accident Number:**	CEN17FA342
Date & Time:	September 10, 2017, 18:50 Local	**Registration:**	N112CD
Aircraft:	RANS INC S-6	**Aircraft Damage:**	Substantial
Defining Event:	Low altitude operation/event	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot and a passenger were conducting a local personal flight. Based on witness statements, the airplane was performing aerobatic maneuvers, including steep climbs and descents and sharp turns. Following one 90° climb followed by a "pivot" and a nearly vertical descent, the witness lost sight of the airplane behind trees and then saw a plume of dust rise above the trees. Another witness reported seeing the airplane "free fall again, nose first," but this time the airplane did not pull up. About a quart of fuel was found in each fuel tank; however, fuel was found in the fuel lines from the fuel tanks to the carburetors, and fuel likely leaked out of the fuel tanks while the wreckage was inverted at the accident site. The composite propeller exhibited little rotational damage likely due to the throttle being at the idle position during ground impact. Examination of the wreckage revealed no preexisting conditions that would have precluded normal operation.

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 terrain clearance while conducting aerobatic flight maneuvers with insufficient altitude to recover.

Findings

Aircraft	Altitude - Not attained/maintained
Aircraft	(general) - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Maneuvering-aerobatics	Low altitude operation/event (Defining event)
Maneuvering-aerobatics	Collision with terr/obj (non-CFIT)

On September 10, 2017, about 1850 central daylight time, an experimental, amateur-built Rans S-6, N112CD, was substantially damaged when it impacted a field about 1 mile southeast of Stonewall, Texas. The pilot and the passenger received fatal injuries. The airplane was owned by Buck EC and was being operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions existed near the accident site at the time of the accident, and no flight plan was filed. The flight departed from Burg Lake Aero (30TX), Stonewall, Texas, about 1700 on a local flight.

A witness reported that he observed the airplane flying near his house between about 1830 and 1840. He initially saw the airplane heading west after turning sharply with its wings "nearly perpendicular to the ground." The airplane "snapped" to a level flight attitude, and then it climbed and descended in a "short rollercoaster manner." The airplane returned to a level flight attitude, turned to the north, and descended below the tree line as if the airplane would be landing at 30TX. Shortly afterward, the witness observed the airplane climbing over the hills north of Stonewall, Texas. The airplane turned to the east and then back to the south, paralleling a road. The witness stated that the airplane then "turned sharply" to the west about 1 mile from the witness' house. The airplane then made a steep climb and then descended "at a sharp angle." The witness reported that his wife thought the airplane was going to crash, but the airplane pulled up and leveled off briefly. The airplane then made another steep climb, which the witness described as a 90° climb. He observed the airplane "pivot" and then descend at a steep angle "nearly vertically." The witness lost sight of the airplane behind the trees, and then he saw a plume of dust rise above the trees. The witness stated that he called 911 at 1850 to report the accident.

Another witness reported that she was driving with her husband when they saw the airplane "dive" toward the ground. This witness stated that she saw the airplane recover and that she thought the airplane was doing "stunts." She observed the airplane "free fall again, nose first," but the airplane did not pull up again.

Pilot Information

Certificate:	Private	**Age:**	39,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Unknown	**Last FAA Medical Exam:**	October 18, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	230 hours (Total, all aircraft)		

The 39-year-old pilot held a private pilot certificate with a single-engine land rating. He held a third-class airman medical certificate that was issued on October 18, 2013, with no limitations. During his medical examination in October 2013, the pilot reported that his total flight experience as 230 hours.

Aircraft and Owner/Operator Information

Aircraft Make:	RANS INC	**Registration:**	N112CD
Model/Series:	S-6	**Aircraft Category:**	Airplane
Year of Manufacture:	2001	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	10011423
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	January 10, 2017 Condition	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	488.7 Hrs as of last inspection	**Engine Manufacturer:**	ROTAX
ELT:	C91 installed, not activated	**Engine Model/Series:**	912-UL
Registered Owner:	On file	**Rated Power:**	80 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The airplane, which was built in 2001, was a two-seat, single-engine Rans S-6, serial number 10011423, with tricycle landing gear. The airplane was equipped with an 80-horsepower Rotax 912-UL engine, serial number 4404639, which powered a three-bladed composite Whirlwind propeller. The hour meter indicated 488.7 hours at the accident site. The airplane's maintenance records were not obtained as part of the investigation.

The airplane was equipped with a BRS-5 model 1200 ballistic recovery parachute system. It was not deployed during the accident flight.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	T82,1694 ft msl	**Distance from Accident Site:**	14 Nautical Miles
Observation Time:	17:55 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	70°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.11 inches Hg	**Temperature/Dew Point:**	28°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Stonewall, TX (30TX)	**Type of Flight Plan Filed:**	None
Destination:	Stonewall, TX (30TX)	**Type of Clearance:**	None
Departure Time:	17:00 Local	**Type of Airspace:**	

At 1555, the surface weather observation at the Gillespie County Airport (T82), Fredericksburg, Texas (about 14 miles west of the accident site) indicated the following: wind 070° at 6 kts, visibility 10 miles, sky clear, temperature 28°C, dew point 10°C, and an altimeter setting of 30.11 inches of mercury.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	30.227222,-98.669998(est)

The airplane crashed in a soft, sandy field located about 3/4 mile southeast of 30TX. The main wreckage was found inverted 38 ft from the initial impact point along a 180° heading. The initial impact mark found in the sand was consistent with the left main landing gear. A depression in the sand about 8 ft to the right of the initial impact mark was consistent with the right main landing gear. A depression in the sand forward of the initial impact point was consistent with the airplane skidding on its belly and the left wing impacting the sandy field. Another depression in the sand was located 20 ft from the initial impact point. Two pieces of the engine mounts and one of the propeller blades were found near that depression. The wings and empennage remained attached to the fuselage.

Examination of the left wing, fuselage, cabin, and engine compartment revealed extensive downward and aft buckling and crushing of the aluminum tubular airframe structure. Numerous fractures that were consistent with overload fractures were observed. The aluminum nosewheel was bent and crushed and had separated from the nose landing gear, which was pushed aft. The aluminum left main wheel was bent and crushed and had separated from the left main landing gear. The aluminum right wheel remained attached to the right main landing gear, which was intact and exhibited no crushing damage. The propeller hub was not damaged. The engine firewall was bent aft and down. The cockpit exhibited damage consistent with downward and aft crushing and buckling. The empennage was intact, but the tubular structure of the tail was fractured aft of the fuselage. The left wing spar was fractured mid-span. The right wing spar was intact. Both wing struts were buckled.

The examination of the cockpit revealed that both ignition switches and the fuel selector were in the ON position. The throttle was found in the idle position, and the throttle control was bent. The choke was off, and the RPM gauge was at zero. The pitch trim was near neutral.

Examination of the fuel system revealed that the left and right fuel tanks had about 1 quart of fuel in each tank. Fuel was found in the fuel lines to the fuel selector, fuel filter, and engine-driven fuel pump. Fuel was also found in the fuel lines to the two carburetors, and a small amount of fuel was found in the carburetor fuel bowls.

Examination of the composite, three-bladed propeller revealed that one of the blades had separated at the propeller hub. The blade was otherwise intact and did not exhibit any impact marks or chordwise scratching. Another blade was intact and attached to the propeller hub, and this blade did not exhibit any chordwise scratching or leading-edge nicks or abrasions. The last blade was broken about mid-span, but it did not exhibit any leading-edge nicks or chordwise scratching.

The ailerons, rudder, and flaps exhibited flight control continuity from the cockpit controls to the control surfaces. The elevator control tubes exhibited continuity except for a fractured rod at the elevator bellcrank in the cockpit. The fracture was consistent with an overload fracture.

After the on-scene examinations were completed, the Rotax 912-UL engine was shipped to a facility in Lucedale, Mississippi, for further examination and test run. The engine was operational during the engine run, which included multiple engine throttle bursts. No anomalies were noted during the engine functional test or examination.

Medical and Pathological Information

An autopsy of the pilot was performed by the Travis County Office of the Medical Examiner, Austin, Texas. The cause of death was blunt force injuries.

Toxicology testing performed at the Federal Aviation Administration's Forensic Sciences Laboratory was negative for carbon monoxide and ethanol. Ranitidine was detected in the pilot's urine and blood (heart). Ranitidine is used to prevent and treat symptoms of heartburn associated with acid indigestion and is considered not to be impairing.

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Carl Newton; San Antonio FSDO; San Antonio, TX
Original Publish Date:	June 25, 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=95973