Aviation Investigation Final Report

Location:	Era, Texas	**Accident Number:**	CEN17FA075
Date & Time:	January 12, 2017, 11:00 Local	**Registration:**	N94RG
Aircraft:	FIELDS Steen Skybolt	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

A witness reported that he was outside his house when he heard an airplane "flying aerobatics." He said that he heard the airplane conduct two to three passes and that he could hear the engine "cycling under load as they do in airshows." He then went to the other side of the house, at which point he saw the airplane in a hammerhead climb (climbing straight up); the airplane then entered a slow, spiraling descent straight down, during which he did not hear engine noise. The airplane made about four spirals before it went out of sight behind rising terrain. The witness added that it did not appear that any attempt was made to recover from the descent. He was uncertain about what altitude the airplane was at when it was at the top of the hammerhead maneuver. The airplane wreckage was found less than 1/4 mile from the pilot's private grass airstrip. The examination of the wreckage revealed no preimpact mechanical malfunctions or failures that would have precluded normal operation. Given the witness statement, it is likely that the pilot lost airplane control while conducting aerobatic flight maneuvers and that there was insufficient altitude to recover.

Probable Cause and Findings

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

The pilot's loss of airplane control while conducting aerobatic flight maneuvers with insufficient altitude to recover.

Findings

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

Factual Information

History of Flight

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

On January 12, 2017, between 1100 and 1200 central standard time, an experimental, amateur-built Steen Skybolt airplane, N94RG, collided with terrain after a loss of control near Era, Texas. The pilot was fatally injured, and the airplane sustained substantial damage. The airplane was owned and being operated by the pilot as a 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions existed near the accident site at the time of the flight, and a flight plan had not been filed. The flight departed from the pilot's private grass airstrip, located less than 1/2 mile from the accident site, between 1100 and 1200.

A witness reported that he was outside his house when he heard an airplane "flying aerobatics." He said that he heard the airplane conduct two to three passes and that he could hear the engine "cycling under load as they do in airshows." He then went to the other side of the house, at which point he saw the airplane in a hammerhead climb (climbing straight up); the airplane then entered a slow, spiraling descent straight down, during which the witness did not hear engine noise. Although he was certain the airplane was spiraling down and not in a flat spin, he was less certain if it was in a right or left spiral. The airplane made about four spirals before it went out of sight behind rising terrain. He added that it did not appear that any attempt was made to recover from the descent. He was uncertain about what altitude the airplane was at when it was at the top of the hammerhead maneuver. He said he saw the airplane sometime between 1100 and 1200 and that the temperature outside was very warm and the sky was "incredibly" clear.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	27,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Rear
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	March 29, 2016
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	2250 hours (Total, all aircraft)		

The pilot held an airline transport pilot certificate with multiengine and single-engine airplane ratings; single-engine operations were limited to commercial privileges. He was issued a Federal Aviation

Administration first-class medical certificate on March 29, 2016. At the time of his medical examination, the pilot reported a total of 2,250 hours of civil flight experience. The number of hours the pilot flew in the accident airplane could not be determined.

Aircraft and Owner/Operator Information

Aircraft Make:	FIELDS	**Registration:**	N94RG
Model/Series:	Steen Skybolt	**Aircraft Category:**	Airplane
Year of Manufacture:	1990	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	001
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	IO-540-B1A5
Registered Owner:	On file	**Rated Power:**	290 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The experimental, amateur-built, open-cockpit biplane was manufactured in 1990. The airplane was equipped with a six-cylinder Lycoming IO-540-B1A5 engine, serial number L-634-48, that produced 290 horsepower at 2,575 rpm.

Although the airplane was purchased by the pilot around September 2016, the airplane's registration still indicated that it was registered to the previous owner. The airplane was kept in a hangar and operated out of the accident pilot's private grass airstrip near Era, Texas.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DTO,642 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	10:53 Local	**Direction from Accident Site:**	170°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 4000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	22°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Era, TX	**Type of Flight Plan Filed:**	None
Destination:	Era, TX	**Type of Clearance:**	None
Departure Time:	11:00 Local	**Type of Airspace:**	

At 1053, the surface weather observation at Denton Enterprise Airport (DTO), Denton, Texas, located 20 nautical miles south of the accident site, was wind from 190° at 9 knots; visibility 10 miles; cloud condition 4,000 ft broken; temperature 22°C; dew point 17°C; and altimeter setting 30.10 inches of mercury (inHg).

At 1153, the DTO surface weather observation was wind from 220° at 10 knots; visibility 10 miles; cloud condition 2,600 ft broken; 4,500 ft overcast; temperature 22°C; dew point 16°C; altimeter setting 30.09 inHg.

At 1235, the DTO surface weather observation was wind from 341° at 14 knots; visibility 10 miles; cloud condition 2,400 ft broken; 3,300 ft broken; 4,700 ft overcast; temperature 15°C; dew point 8°C; altimeter setting 30.09 inHg. Remarks: wind shift at 1215.

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:**	33.516109,-97.260002

The wreckage was located in a pasture about 1,100 ft from the departure end of the north runway of the pilot's grass airstrip on a magnetic heading of 350°. The damage to the engine cowling, cockpit, and wing surfaces indicated that the airplane collided with terrain in about a 45°-nose-down attitude. The

engine compartment, fuselage, wings, and empennage exhibited crushing and buckling from the ground impact, but the airplane remained intact. There was no postimpact fire. Flight control continuity was confirmed from all flight control surfaces to their respective cockpit controls. The elevator trim continuity was confirmed from the elevator trim control to the elevator trim tabs.

One of the propeller blades was visible at the accident site, and it was bent backward about midspan, and it exhibited minimal damage on its chambered surface and flat side. Its blade tip exhibited abrasion and nicks along the leading edge of the blade. The propeller hub was found in 14 inches of soft, clay soil. The second blade was found underneath the wreckage in clay soil, and it exhibited twisting, extensive chordwise scratching along the entire span of the blade, and gouges and nicks to the blade's leading edge.

The examination of the engine revealed drive train continuity of the crankshaft and camshaft when the propeller was turned. The accessory gears and the fuel pump gear rotated, and all six pistons moved up and down. The top spark plugs exhibited normal signatures and appeared to be almost new. Both the left and right magnetos were separated from the engine. The left magneto produced spark on all six towers. The right magneto was damaged from impact, and it produced no spark. The fuel servo was broken at the throttle plate. The fuel servo had residual fuel in it, and all fuel lines connected to the fuel servo had fuel in them.

The engine rpm gauge indicated 2,450 rpm with 407.86 hours recorded. The airspeed indicator needle was found at 338 knots. The airplane's *g*-meter needle moved freely, but the *g*-meter indicators that recorded acceleration showed +10 and -5 *g*s. The engine rpm gauge, airspeed indicator, and *g*-meter were sent to the National Transportation Safety Board's (NTSB) Materials Laboratory for examination.

Medical and Pathological Information

The Dallas County Institute of Forensic Sciences, Dallas, Texas, performed an autopsy of the pilot. The cause of death was "blunt force trauma," and the manner of death was "an accident."

The FAA's Bioaeronautical Sciences Research Laboratory conducted toxicology testing on specimens for the pilot. The testing was negative for all tested substances.

Tests and Research

The NTSB's Materials Laboratory examined the engine rpm gauge, airspeed indicator, and *g*-meter. The rpm gauge and airspeed indicator were disassembled and examined using a stereo microscope. No slap or impact marks were observed on the gauge or indicator dial faces.

The rear housing of the *g*-meter was removed for operational examination. No impact marks were observed on its outer case (housing). With the housing removed, no damage was observed on the meter's

internal mechanical parts. The gears, weights, and other mechanical parts moved freely. When the reset button was pressed, the meter's dial needles (*g*-force indicators) reset to their respective original positions. The *g*-meter appeared to be operational.

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Jose Cabrera; NTX FDSO; Irving, TX John Butler; Lycoming Engines; Arlington, TX
Original Publish Date:	July 12, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=94602