Aviation Investigation Final Report

Location:	Newton, North Carolina	**Accident Number:**	ERA14FA256
Date & Time:	May 25, 2014, 20:05 Local	**Registration:**	N4493
Aircraft:	Stolp Starduster SA-300	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Several witnesses reported seeing the airplane spiral to the ground. A review of a video recorded by another witness revealed that, during the flight, the airplane entered a left spin and completed about seven revolutions before descending behind a treeline and impacting a wheat field. Examination of the wreckage did not reveal any preimpact mechanical malfunctions that would have precluded normal operation.

A flight instructor reported that the pilot had been attempting to teach himself aerobatics in his experimental, amateur-built airplane before the accident and that he had provided the pilot one aerobatic lesson in the pilot's airplane. The flight instructor noted that the pilot's knowledge and skill level with spin entry and recovery were inadequate. The pilot subsequently contacted the flight instructor on two more occasions and requested more training. The flight instructor agreed to do the training as long as it was performed in his airplane; however, the pilot would not agree to use the instructor's airplane and did not receive further aerobatic training.

Probable Cause and Findings

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

The pilot's failure to recover from an intentional spin. Contributing to the accident was the pilot's lack of adequate spin entry and recovery training.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	(general) - Not attained/maintained
Personnel issues	Total experience w/ equipment - Pilot

Factual Information

History of Flight

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

On May 25, 2014, about 2005 eastern daylight time, an experimental, amateur-built Stolp Starduster SA-300, N4493, operated by a private individual, was substantially damaged when it impacted a wheat field following an intentional spin near Newton, North Carolina. The private pilot was fatally injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the local flight. The flight originated from Laneys Airport (N92), Maiden, North Carolina, about 1945.

The airplane was based at N92. According to a flight instructor, prior to the accident flight, the pilot had been attempting to teach himself aerobatics in the accident airplane. The flight instructor encouraged the pilot to receive formal training, but the pilot preferred to fly his own airplane. The flight instructor agreed on one occasion to provide training in the pilot's airplane. They performed steep turns, stalls, and slow flight uneventfully. They then performed several spins, including power on, power off, and accelerated spin entries; however, the pilot's knowledge and skill level were not quite adequate and the flight instructor terminated the spin training early. Additionally, the flight instructor noticed some deficiencies with the airplane during landing and advised the pilot not to fly it until repairs could be completed. The pilot subsequently contacted the flight instructor on two more occasions and requested more training. The flight instructor agreed to the training, as long as it was performed in his Decathlon, which the pilot did not agree to.

Three witnesses, who lived near the accident site, observed the airplane in level flight when the engine noise decreased and it entered a spin. The airplane continued to spin and descended toward the ground. One witness stated that the prior to the spin, the airplane performed a few tricks and a couple of stalls. A second witness stated that the airplane stopped spinning about 300 feet above the ground, but continued to nose dive into a wheat field. The third witness recorded a video of the accident sequence and a copy was forwarded to the NTSB Vehicle Recorders Laboratory, Washington, D.C., for further review.

Review of the video revealed that the airplane entered a left-turn spin and completed about seven revolutions before disappearing behind a treeline.

Pilot Information

Certificate:	Private	**Age:**	55
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Rear
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 With waivers/limitations	**Last FAA Medical Exam:**	November 6, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	115 hours (Total, all aircraft), 999999 hours (Total, this make and model)		

The pilot held a private pilot certificate with a rating for airplane single-engine land, which was issued on December 11, 2011. His most recent Federal Aviation Administration (FAA) third-class medical certificate was issued on November 6, 2013. At that time, he reported a total flight experience of 115 hours. The pilot's logbook was not recovered.

Aircraft and Owner/Operator Information

Aircraft Make:	Stolp Starduster	**Registration:**	N4493
Model/Series:	SA-300	**Aircraft Category:**	Airplane
Year of Manufacture:	1971	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	224
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	May 20, 2009 Condition	**Certified Max Gross Wt.:**	1704 lbs
Time Since Last Inspection:	40 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	873 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	C91A installed, not activated	**Engine Model/Series:**	O-320
Registered Owner:	THOMAS JAMES B	**Rated Power:**	150 Horsepower
Operator:	THOMAS JAMES B	**Operating Certificate(s) Held:**	None

The two-seat tandem, bi-wing, fixed tailwheel airplane, serial number 224, was constructed from a kit of steel tubing, with the wing and tail surfaces covered in fabric. The wing spars were constructed of wood. The kit was manufactured in 1971 and the airplane was issued an FAA airworthiness certificate in 1980. It was powered by a Lycoming O-320, 150-horsepower engine, equipped with a Sensenich two-blade, fixed-pitch propeller.

According to the aircraft logbooks, the airplane's most recent condition inspection was completed on May 20, 2009. At that time, the airplane had accumulated 873.4 total hours of operation. The engine had accumulated 1,623.5 total hours of operation; of which, 1,054.5 hours were accumulated since the last major overhaul was performed in 1966. According to the tachometer, the airplane had flown about 40 hours from the time of the condition inspection until the accident.

The airplane was involved in a prior accident in 2010 and was sold by a salvage facility to the pilot. The pilot made a logbook entry on June 16, 2012, noting that the engine was in airworthy condition; however, the pilot was not qualified to perform a condition inspection on the airplane.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HKY,1190 ft msl	**Distance from Accident Site:**	14 Nautical Miles
Observation Time:	19:53 Local	**Direction from Accident Site:**	300°
Lowest Cloud Condition:	Few / 9000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / None	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.14 inches Hg	**Temperature/Dew Point:**	23°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Maiden, NC (N92)	**Type of Flight Plan Filed:**	None
Destination:	Maiden, NC (N92)	**Type of Clearance:**	None
Departure Time:	19:45 Local	**Type of Airspace:**	

Hickory Regional Airport (HKY), Hickory, North Carolina, was located about 14 miles northwest of the accident site. The recorded weather at HKY, at 1953, was: wind from 190 degrees at 3 knots; visibility 10 miles; few clouds at 9,000 feet; temperature 23 degrees Celsius; dew point 16 degrees Celsius; altimeter 30.15 inches of mercury.

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:**	35.623889,-81.138336

The airplane impacted a wheat field and came to rest in a flat, upright attitude, on a magnetic heading about 130 degrees. The bi-wing had partially separated from the fuselage and was canted forward. The left and right ailerons remained attached to their respective upper and lower wings. The empennage remained intact and exhibited little damage. Control continuity was confirmed from the elevator and rudder to the rear cockpit control stick. The aileron system was constructed of push-pull tubes, which were impact damaged and continuity could not be confirmed. Continuity was also confirmed from the elevator trim tab to the pilot's seat (rear).

The cockpit was crushed, but the pilot's seat and 4-point harness remained intact. The forward fuselage fuel tank was compromised and an odor of fuel was present. The engine remained partially attached the fuselage. The two propeller blades remained attached to the hub. The propeller flange had cracked and the propeller separated from the crankshaft. The airplane was not insured and not immediately recovered from the wheat field.

Following its recovery, the engine was further examined by an FAA inspector. The inspector noted cable continuity to the carburetor. The carburetor fuel screen was clean and the oil screen was absent of metallic particles. Due to impact damage, the crankshaft could only rotate about 1 inch, but the inspector was able to verify that all pistons moved and gears at the rear accessory section turned. Both magnetos produced spark at all leads when rotated by hand and the spark plugs exhibited normal wear. The throttle cable remained attached to the carburetor and the mixture control arm remained attached to the upper portion part of the carburetor assembly.

Medical and Pathological Information

An autopsy was performed on the pilot on May 28, 2014, by the Office of the Chief Medical Examiner, Chapel Hill, North Carolina. The cause of death was attributed to multiple injuries and no findings that could be considered causal to the accident were reported.

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma. The results were negative for carbon monoxide, alcohol, and drugs.

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Edwin G Shields; FAA/FSDO; Charlotte, NC Troy Helgeson; Lycoming Engines; Williamsport, PA
Original Publish Date:	September 24, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89267