Aviation Investigation Final Report

Location:	Weston, Florida	**Accident Number:**	MIA01FA041
Date & Time:	December 14, 2000, 09:52 Local	**Registration:**	N260DB
Aircraft:	Christen Industries Pitts S-2B	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

An FAA contract tower controller at the Hollywood North Perry Airport stated that at 0950 he received a radio communications transmission saying, "mayday mayday mayday pitts 260DB in an unrecoverable flat spin at 3,500 feet." The aircraft was discovered in an partially inverted, near vertical pitch attitude, in an area of heavy brush, sawgrass, and tall trees in the Everglades, in about 3 to 4 feet of water. The aircraft had incurred substantial damage, and the pilot/owner and PIC were found outside the aircraft, with both having sustained fatal injuries. An individual familiar with both pilots stated that the pilot normally flew the accident aircraft with the PIC occupying the front seat, while preparing to regain currency, and pass a biennial flight review, which had expired, but he had been having difficulty handling the aircraft, and was not yet ready for the flight review. Examination of the wreckage did not reveal any preaccident failures or malfunctions to the aircraft structure, the flight controls, or the engine. Examination of N260DBs weight and balance revealed that the aircraft's weight and center of gravity limits had been exceeded. The aircraft weighed 1,745 lbs, and its estimated CG was about 90.87. According to the airplane flight manual, the airplane's weight limit in the aerobatic category is 1,625 lbs. Its forward CG limit is 89.58 at 1,625 lbs, and its most rearward CG limit is 90.50 at 1,625 lbs.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: An inflight loss of control by both pilots while maneuvering, which resulted in an inverted flat spin, an uncontrolled descent, and an impact with terrain/water. A factor contributing to the accident was the failure of both pilots to ensure that the aircraft's weight and center of gravity limitations had not been exceeded.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING

Findings
1. (F) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - PILOT IN COMMAND
2. STALL/SPIN - INADVERTENT - FLIGHTCREW
3. AIRCRAFT CONTROL - ATTEMPTED - PILOT IN COMMAND
4. AIRCRAFT CONTROL - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. TERRAIN CONDITION - SWAMPY

Factual Information

HISTORY OF FLIGHT

On December 14, 2000, about 0952 eastern standard time, a Christen Pitts S-2B, N260DB, registered to, and operated by a private individual, as a Title 14 CFR Part 91 personal flight, crashed in the Everglades, near Weston, Florida. Visual meteorological conditions prevailed, and no flight plan was filed. The aircraft incurred substantial damage, and the airline transport-rated pilot in command, and the pilot/owner were fatally injured. The flight originated from Hollywood North Perry Airport, Hollywood, Florida, about 0930.

According to a Federal Aviation Administration (FAA) contract tower controller at the Hollywood North Perry Airport, at 0950, he received a radio communications transmission saying, "mayday mayday mayday pitts 260DB in an unrecoverable flat spin at 3,500 feet." In addition, a detective with the Broward County Sheriff's Office stated that a sheriff's office dispatcher received a cell telephone call from an unidentified motorist traveling along Interstate 75 (Alligator Alley) about 0953, stating that he/she had just observed an aircraft crash into the Everglades, in the vicinity of the rest stop at mile marker 35. In addition, a detective with the Broward County Sheriff's Office stated that a sheriff's office dispatcher received a cell phone call from a motorist travelling along Interstate 75 about 0953, stating that he/she had just observed an airplane crash into the Everglades, but attempts by the NTSB to obtain the identity of the witness, with the assistance of the Broward Sheriff's Office, have all been unsuccessful.

The aircraft was discovered in an marshy area which consisted of heavy brush, sawgrass, and small trees, in the Everglades, slightly west of the rest stop. The aircraft had incurred substantial damage, and both occupants of the aircraft were found outside the aircraft, and had both sustained fatal injuries.

PERSONNEL INFORMATION

The pilot/owner of the accident aircraft, age 57, held an FAA private pilot certificate, with an airplane single engine land rating, issued on June 6, 1996. The pilot also held an FAA class 3 medical certificate issued on March 28, 2000, with the limitation that the holder must wear corrective lenses. According to the pilot/owner's attorney, the pilot's flight logbook was never found, but information obtained from the insurance company which insured the aircraft, showed that the pilot had accumulated about 1,000 total flight hours, with about 200 flight hours in the same type aircraft.

The pilot-in-command (PIC), age 44, held an FAA airline transport pilot certificate, issued on August 10, 2000, with an airplane multiengine land rating, as well as a commercial pilot

certificate, with single engine land and sea ratings. The PIC also held a flight engineer certificate, issued on October 6, 2000, and an FAA class 1 medical certificate last issued on September 21, 2000. According to the PIC's wife, the PIC's personal flight logbook was never found, but according to information supplied by the insurance company, the pilot had accumulated about 7,500 total flight hours, with about 100 flight hours in the same type aircraft, as the one in which the accident occurred.

Due to the absence of pilot logbooks, the NTSB was unable to verify pertinent flight experience, but an individual familiar with both pilots, who is a fellow aerobatic pilot in the same group of pilots, and who is also the FAA licensed mechanic that maintained the accident aircraft for the pilot/owner, told the NTSB that the pilot/owner normally flew N260DB with the PIC, who had considerable amount aerobatic experience. He further stated to the NTSB that the PIC normally occupied the front seat, and that the pilot/owner did not yet have a current biennial flight review, and he was flying with the PIC to prepare for the flight review, but he had been having difficulties landing the aircraft during the practice flights. Furthermore, the individual also told the NTSB that during the course of practicing landings, the pilot/owner had expressed his frustration, and had wanted to practice aerobatics, so he and the PIC had started including aerobatic maneuvers during their practice flights together, but that the PIC had stated that the pilot/owner was having difficulty with hammerhead stalls, in addition to his continued difficulties landing the "Pitts", and that he was not yet ready for the flight review.

AIRCRAFT INFORMATION

N260DB, serial number, 5170, is a Pitts model S-2B, two-place aerobatic biplane, with conventional landing gear, which was manufactured in 1989. At the time of the accident the aircraft had accumulated about 578 total flight hours. The airplane had received an annual inspection on December 20, 1999, about 79 flight hours before the accident. N260DB was equipped with a Textron Lycoming AEIO-540-D4A5, 260 horsepower engine, which had also accumulated about 578 flight hours at the time of the accident. Maintenance records showed that the engine had been removed, repaired and reinstalled on October18, 1990, at 50.3 hours, as a result of there having had a sudden engine stoppage. The propeller was a two bladed constant speed Hartzell propeller, model number HC-C2Y(K)-4CF.

METEOROLOGICAL INFORMATION

The Fort Lauderdale Hollywood International Airport, 0853, surface weather observation, was winds from 100 degrees at 9 knots, visibility 10 statute miles, few clouds at 2,300 feet, temperature 77 degrees F, dew point temperature 72 degrees F, Altimeter setting 30.32. inches Hg. The Fort Lauderdale Hollywood International Airport was located about 20 nautical miles east of the accident site, at an elevation of 9 feet.

WRECKAGE AND IMPACT INFORMATION

N260DB crashed in the Everglades, northwest of a rest area, near mile marker 36, on the

northbound side of Interstate 75 (Alligator Alley), in an unincorporated area of Broward County, Florida, near Weston, Florida. The geographic position of the main wreckage was obtained by use of a global positioning system (GPS) receiver that was on board a Broward County Sheriff's Office helicopter, and the position of the main wreckage was recorded by Sheriff's Deputies as 26 degrees, 08.93 minutes north latitude, 080 degrees, 38.13 minutes west longitude. The accident aircraft had impacted the swamp in a slightly inverted and near vertical pitch attitude, in an area of heavy brush, sawgrass, and small trees, in about 3 to 4 feet of water.

All components of the aircraft, which were necessary to sustain flight were located in the immediate vicinity of the main wreckage of the aircraft. The aircraft wreckage was confined to impact crater, with the exception of the canopy. The engine and cockpit areas were submerged under the water/silt of the Everglades, with only the aft fuselage and empennage extending out of the water. There was heavy impact damage to the propeller, engine, and front of the aircraft. Frontal compression wrinkles were evident, and there was more compression damage on the left side, and the damage extended from the nose of the aircraft, to just aft of the rear cockpit. The wings had also suffered heavy impact damage, and had been mostly detached from the main fuselage. The aft fuselage/empennage was aligned about 20 degrees from the vertical, and had been relatively undamaged. The canopy which had detached, was found undamaged, about 400 yards to the north northwest of the main aircraft wreckage.

After its recovery from the Everglades, the continuity of N260DB's flight control system was confirmed for roll, pitch, and yaw, by tracing the push rods and cables to the respective flight control surfaces. There was no evidence of damage to flight control surfaces on the empennage, and there was also no evidence that the flight controls had incurred any preimpact failure or malfunction. All separation points in the flight control system were consistent with overstress separation due to the impact. All separation points of structural components, were also consistent with overstress, due to ground impact.

The engine had separated with the firewall from the airframe structure, with the engine core remaining relatively intact, but displaying significant impact damage. The front cylinders had incurred severe impact. The propeller was still attached. The engine assembly and accessories were examined after recovery. The engine was rotated by hand, and continuity of the crankshaft, camshaft, valve train and accessory drives were accomplished. Each cylinder, except for the No. 2 cylinder, produced compression when the engine was rotated. The No. 2 cylinder had sustained severe impact damage to the associated head, rocker box and valves. However, when examined by borescope, the top end components showed no evidence of preimpact failure or malfunction. All fuel system lines were damaged, and there was aviation fuel present in the crater due to breaches in the fuel system. When examined the lubrication system, though damaged, was found to have remnants of clean oil, with no anomalies being evident. The front of the aircraft had been submerged in water, and both magnetos were wet had to be dried. After they had dried off, they were tested, and both units developed sparks at each terminal when tested. All spark plugs were removed, and each were found to have a brown color, consistent with normal operation. They possessed a moderate amount of wear,

and all electrode gaps were found to have been at a normal setting.

The propeller had remained attached to the crankshaft, and the crankshaft had been bent and partially cracked just aft of the flange. Visual inspection of the propeller showed it to be in low pitch, and it exhibited damage consistent with engine rotation at impact. One blade displayed torsional aft "S" bending, heavy scouring and burnishment, both in the chordwise and spanwise directions. The same blade also exhibited both leading and trailing edge damage, and its counterweight had broken off. The other blade had also been bent aft, and it too exhibited impact damage, but to a lesser degree. The propeller governor had been separated from the mounting flange, and was not recovered, but the gasket screen was found, and was observed to be unobstructed.

MEDICAL AND PATHOLOGICAL INFORMATION

Dr. Eroston A. Price, M.D., Associate Medical Examiner, Broward County Medical Examiner's Office, Fort Lauderdale, Florida, performed the postmortem examination on the pilot/owner, and according to Dr. Price, the cause of death was attributed to multiple blunt trauma injuries. The Medical Examiner's Office also conducted forensic toxicology studies on specimens from the pilot/owner for ethanol, drugs and nicotine, and the results were positive for nicotine and ethanol, with 0.02g percent ethanol present in the brain. The FAA Toxicology Laboratory, Oklahoma City, Oklahoma also performed toxicological studies for carbon monoxide, cyanide, ethanol, and drugs, on specimens from the pilot/owner, and quinine was found to be present in the liver.

According to the Broward County Sheriff's Office, the pilot/owner was found in position 26 degrees, 08.93 minutes north latitude, 080 degrees, 38.15 west longitude. Then the pilot/owner's geographic position was plotted, he was found to be about 110 feet due west of the main aircraft wreckage.

Dr. Eroston A. Price, M.D., Associate Medical Examiner, Broward County Medical Examiner's Office, Fort Lauderdale, Florida, also performed the postmortem examination on the PIC, and according to Dr. Price, the cause of death was attributed to multiple blunt trauma injuries. The FAA Toxicology Laboratory, Oklahoma City, Oklahoma, also performed toxicological studies on specimens from the PIC, and the tests were negative for carbon monoxide, cyanide, ethanol, and drugs.

According to the Broward County Sheriff's Office, the PIC was found in position 26 degrees, 08.92 minutes north latitude, 080 degrees, 38.14 minutes west longitude. When the PIC's geographic position was plotted, he was found to be about 83 feet to the southwest of the main wreckage.

TESTS AND RESEARCH

Examination of the pilot/owner's parachute revealed that the parachute had been properly packed, and the repack date had not expired. The examination also revealed that the parachute had partially deployed, and according to the Master Parachute Rigger who examined the parachute, its partial deployment was consistent with there having not been sufficient altitude to permit the parachute to fully open.

Examination of the PIC's parachute revealed that the parachute had also been properly packed, and the repack date had not expired. According to the Master Parachute Rigger who examined the parachute, the PIC's parachute would have deployed, and would have worked properly, had its rip cord been pulled at a safe altitude.

A postcrash aircraft weight and balance was performed, and at the time of the accident the estimated total weight of the aircraft was about 1,745 lbs, and its estimated center of gravity (CG) was about 90.87, which both exceed the limit specified in the airplane flight manual. According to the airplane flight manual, the airplane's weight limit in the aerobatic category is 1,625 lbs. The forward CG limit is 89.58 at 1,625 lbs, and the most rearward CG limit is 90.50 at 1,625 lbs.

The International Aerobatic Club (IAC) assisted the NTSB and evaluated the approximate position and distance of the aircraft wreckage with respect to those of its two occupants, and the IAC report is provided as an enclosure to this report.

ADDITIONAL INFORMATION

The airplane wreckage was released to Mr. Steve Smalley, Air and Sea Recovery Inc., Fort Lauderdale, Florida, on December 16, 2000.

Pilot Information

Certificate:	Private	**Age:**	58,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Rear
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	March 28, 2000
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1000 hours (Total, all aircraft), 200 hours (Total, this make and model)		

Other flight crew Information

Certificate:	Airline transport; Commercial; Flight engineer	**Age:**	44,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):		**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	September 21, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	7500 hours (Total, all aircraft), 100 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Christen Industries	**Registration:**	N260DB
Model/Series:	Pitts S-2B PITTS S-2B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic	**Serial Number:**	5170
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	December 20, 1999 Annual	**Certified Max Gross Wt.:**	1625 lbs
Time Since Last Inspection:	79 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	587 Hrs at time of accident	**Engine Manufacturer:**	Textron Lyc.
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	AEIO540D4A5
Registered Owner:	James Louis Murphy	**Rated Power:**	260 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	FLL	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	09:53 Local	**Direction from Accident Site:**	100°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	110°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	26°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Pembroke Pines, FL (HWO)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	09:00 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	26.148611,-80.635002

Administrative Information

Investigator In Charge (IIC):	Lovell, John
Additional Participating Persons:	Terry Hurst; FAA FSDO; Fort Lauderdale, FL Edward Rogalski; Textron Lycoming Engines; Belleview, FL Scott Perdue; International Aerobatic Club; Fort Worth, TX
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Last Revision Date:	
Investigation Class:	Class
Note:	
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