Aviation Investigation Final Report

Location:	UPLAND, California	**Accident Number:**	LAX00LA068
Date & Time:	January 8, 2000, 10:34 Local	**Registration:**	N900SH
Aircraft:	Clark PITTS S1X	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

During an air show, while conducting aerobatic maneuvers, the airplane continued in a spin to ground impact. According to witnesses, the pilot was performing an aerobatic routine with two other airplanes, known as a "squirrel cage" maneuver. The airplanes would take turns entering the aerobatic box to perform a single choreographed maneuver. The routine card indicated that the pilot was to perform multiple snap rolls when the accident occurred. A video of the pilot's routine was examined with the assistance of members of the International Aerobatic Club. The video showed that the pilot made 3 1/2 snap rolls to the right, and then 2 1/2 spins to the left. It appeared there was no flight control problem and the pilot entered a flat spin. The elevator appeared to be loaded and the pilot never broke the stall prior to impact. The pilot had written a magazine article advocating a specific spin recovery method.

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 aerobatic maneuver.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: MANEUVERING

Findings

1. AEROBATICS - PERFORMED - PILOT IN COMMAND
2. (C) STALL/SPIN - NOT CORRECTED - PILOT IN COMMAND

Factual Information

On January 8, 2000, at 1034 hours Pacific standard time, a homebuilt Pitts S1X, N900SH, collided with terrain while performing an aerobatic routine at an airshow at the Cable Airport, Upland, California. The experimental airplane, owned and operated by the pilot, was destroyed. The commercial pilot was fatally injured. The local airshow performance, conducted under 14 CFR Part 91, had originated at the Cable Airport at an unspecified time. Visual meteorological conditions prevailed and no flight plan was filed.

According to witnesses, the pilot was performing an aerobatic routine with two other airplanes, known as a "squirrel cage" maneuver. The airplanes would take turns entering the aerobatic box to perform a single choreographed maneuver. The airshow held a waiver for an "airshow box" (performing area), which was partly over a rock quarry. The routine card indicated that the pilot was supposed to perform multiple snap rolls when the accident occurred.

A video of the pilot's routine was provided to the Safety Board. A frame-by-frame examination was conducted, with the assistance of the International Aerobatic Club. The video showed that the pilot made 3 1/2 snap rolls to the right, then 2 1/2 spins to the left. The elevator appeared to be loaded. The video cut out as the pilot impacted the rock quarry. Witnesses reported that there was a fire on impact. No one on the ground was injured.

According to the Federal Aviation Administration (FAA) airman certification database, the pilot held an airline transport pilot certificate with an airplane multiengine land rating. He also held a commercial pilot certificate with an airplane single engine land rating and a private certificate with a helicopter rating.

The FAA aeromedical certification database revealed that the pilot held a second-class medical, issued March 11, 1999, with the restriction that the pilot must wear corrective lenses.

The aircraft was examined following its recovery from the impact site. The flight controls were inspected. Both rudder pedals remained secured at their respective fittings. Both rudder cables were fractured approximately midspan. The fractured cables displayed frayed ends, and "necking" was evident when viewed under a magnifying lens. The elevator trim was intact and secure at its fitting. The elevator control system was separated at a joint fitting. It remained connected forward of the stick to just aft of the seat. Both the right and left side top and bottom ailerons both moved freely with no noted binding. The right side aileron control system was fractured at the bellcrank joint. The left side aileron control system was fractured at a joint fitting.

No foreign objects were found in any of the control system surfaces. All controls could be manipulated freely by hand.

Examination of the engine revealed significant thermal damage. The propeller could not be rotated by hand. The top and bottom spark plugs were removed and examined. They exhibited normal coloration and wear patterns consistent with the Champion Check-A-Plug chart. The magnetos, fuel pump, and sections of the fuel injection servo displayed significant damage and no testing was conducted. The cylinders were internally examined utilizing a lighted bore scope; they appeared undamaged. The valves were intact and there was no evidence of foreign object ingestion or oil residue. The fuel injector(s) remained at their respective locations with the fuel lines attached. The rocker box covers were removed. The rocker assemblies, springs, and valve retainers were secure at each cylinder assembly. There was no evidence of metal contamination observed at the rockers or oil screen. The oil cooler bypass valve (vernatherm) remained intact. The fuel injection servo fuel inlet screen was removed and displayed no visible contaminants. The oil sump and portions of the accessory case had been displaced, exposing portions of the crankshaft and accessory gears. Visual inspection of the internal components through those voids utilizing a lighted bore scope revealed no evidence of malfunction. There was no evidence of mechanical malfunction.

According to the pilot's ACE, the pilot had not been approved for squirrel cage maneuvers. The pilot held a "level 3" certificate, and according to the ACE, at level 3, any deviations from the planned routine should be approved. He had only approved the pilot for his usual routine.

Pilot Information

Certificate:	Airline transport; Commercial; Private	**Age:**	40,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	March 11, 1999
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	2600 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Clark	**Registration:**	N900SH
Model/Series:	PITTS S1X PITTS S1X	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	001
Landing Gear Type:	Tailwheel	**Seats:**	
Date/Type of Last Inspection:	December 6, 1999 Annual	**Certified Max Gross Wt.:**	0 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	395 Hrs	**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	AEIO-360
Registered Owner:	MARK MADDEN	**Rated Power:**	180 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	ONT ,943 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	17:53 Local	**Direction from Accident Site:**	110°
Lowest Cloud Condition:	Scattered / 20000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Unknown	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	55°C / 25°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(CCB)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	00:00 Local	**Type of Airspace:**	Special

Airport Information

Airport:	CABLE CCB	**Runway Surface Type:**	
Airport Elevation:	1439 ft msl	**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Mars, Noelani
Additional Participating Persons:	TONY COSTANZA; RIVERSIDE , CA RAY MAXON; SANTA PAULA , CA
Original Publish Date:	January 2, 2002
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=48461