Aviation Investigation Final Report

Location:	Avalon, California	**Accident Number:**	LAX05LA283
Date & Time:	August 31, 2005, 12:50 Local	**Registration:**	N216RN
Aircraft:	Avions Robin R.2160	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The airplane impacted the water following an intentional spin, that was not recovered from. According to the surviving student pilot, the instructor was demonstrating a hammerhead maneuver followed by what the student believed was a loop and then a spin. The airplane began "violently spinning towards the water." The student believed he counted 7 or 8 spins to the right, but wasn't positive about the direction. He realized they were spinning too much and were rapidly losing altitude. The instructor told the student to remove his feet from the rudder pedals, and the student complied. The instructor continued with his attempt to stop the spin, to no avail. The instructor then called for a bailout and jettisoned the canopy. The student managed to successfully bailout of the airplane and felt the vertical stabilizer rush past him. He observed the airplane impact the water below him and noticed the instructor's parachute deployed and in the water. The instructor was fatally injured and had a "deep laceration of the right upper chest extending to the right shoulder". Post-accident examination of the instructor's parachute revealed no anomalies that would have prevented its full deployment. Considering the facts that the student successfully bailed out of the airplane before the instructor did, that the instructor's parachute had been deployed and was in the water before the student reached the water, and the instructor's injuries, it is likely that the instructor struck and became ensnared on a portion of the airplane during the bailout. The wreckage was not recovered, therefore, the reason for the instructor's inability to recover from the spin could not be determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flight instructor's unsuccessful recovery from a spin. The underlying reason was not determined.

Findings

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

Findings
1. AEROBATICS - PERFORMED - PILOT IN COMMAND(CFI)
2. STALL/SPIN - INTENTIONAL - PILOT IN COMMAND(CFI)
3. (C) REMEDIAL ACTION - NOT SUCCESSFUL - PILOT IN COMMAND(CFI)
4. BAIL-OUT/EMERGENCY EJECTION - PERFORMED - DUAL STUDENT
5. BAIL-OUT/EMERGENCY EJECTION - NOT SUCCESSFUL - PILOT IN COMMAND(CFI)

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

Findings
6. TERRAIN CONDITION - WATER

Factual Information

HISTORY OF FLIGHT

On August 31, 2005, approximately 1250 Pacific daylight time, an Avions Robin R.2160 airplane, N216RN, impacted the ocean following a loss of control and subsequent flight crew bailout near Avalon, California. The airplane is presumed destroyed. The certified flight instructor was fatally injured and the pilot-rated student sustained minor injuries. The airplane was operated by California Flight Center of Long Beach, California, as an instructional flight under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The flight departed Long Beach Airport at 1221, and was destined for Avalon Airport on Catalina Island. Visual meteorological conditions prevailed and a flight plan was not filed.

According to personnel associated with the operator, Long Beach Flight Standards District Office, and Los Angeles County Life Guard personnel, the flight departed Long Beach and headed toward Catalina Island. The flight entered an aerobatic box over the San Pedro Channel and performed some aerobatic maneuvers. During a telephone interview with the NTSB investigator-in-charge (IIC), the surviving student indicated that the instructor performed a hammerhead stall, followed by a loop. At some point in the maneuver, the airplane entered a spin. The spin's rotation increased and became violent. The instructor attempted to recover, to no avail. Around 2,500 feet, the instructor informed the surviving pilot that they "must get out of this airplane" and jettisoned the canopy. The student unbuckled his 5-point harness and exited the airplane. The student noticed the airplane, with the vertical and horizontal stabilizers still attached brush by him very fast in a nose low pitch attitude. He then deployed his parachute and noticed the airplane in the water along with the instructor's parachute.

The student impacted the water and began clearing himself from the parachute. He then inflated his life preserver and began calling for the instructor pilot, but received no response. The student estimated he was in the water for approximately 1.5 hours before the crew of a privately owned and operated yacht picked him up. They called ahead to the lifeguard unit, who in turn met the yacht. A US Coast Guard flight and marine unit was dispatched to the accident area and found the instructor pilot in the water. His parachute was out of the storage sack but his life vest was not inflated.

The student submitted a written statement regarding the event. It indicated that once they entered the aerobatic box and cleared the area, he performed a series of 3 loops under the instructor's guidance, followed by 2 flick-rolls. The student described all of these maneuvers as "successful." Then, under the instructor's guidance, the student performed a series of 2 spins, both of which were to the left.

The student then relinquished control of the airplane to the instructor and reached into the

checklist pouch and removed his handheld camera to film the next series of maneuvers. The instructor proceeded to perform a hammerhead maneuver followed by what the student believed was a loop and then a spin. The student stopped filming when he suddenly realized that they were "violently spinning towards the water." The student believed he counted 7 or 8 spins to the right, but wasn't positive about the direction. He realized they were spinning too much and that they were rapidly losing altitude. The instructor told the student to remove his feet from the rudder pedals. The student added that he believed he was resting his feet on the pedals, but not pressing on them. He removed his feet from the pedals and brought his knees up to his chest.

The instructor continued with his attempt to stop the spin, but then the propeller eventually slowed and came to a complete stop. The student looked at the instructor, who in turn, looked at the student and "calmly said, 'Let's get out of here.'" The instructor then jettisoned the canopy and air rushed into the cockpit. The student twisted his quick-release mechanism and jumped out of the airplane. He mentioned again that he felt the vertical stabilizer rush past him. The student estimated that their altitude at that point was no more than 1,000 feet above the ocean.

Once clear from the airplane, the student pulled his parachute's ripcord and looked up to see the parachute open. When he looked down, he observed the airplane impact the water to his left. To his right, he saw the instructor's parachute opened and floating on the surface of the water. The student added that as he drifted up from the airplane, he did not see the instructor drift up and never saw him with his parachute open floating down to the surface of the water.

Review of radar data provided by the Southern California Terminal Radar Approach Control facility revealed that the airplane was at the following positions during its last 9 radar returns:

Time	Latitude	Longitude	Altitude (msl)	Ground Speed (knots)
1249:48	33 29 15 N	118 26 56 W	3,700	---
1249:32	33 29 14 N	118 26 52 W	3,100	36
1249:37	33 29 15 N	118 26 56 W	UNK	17
1249:41	33 29 12 N	118 26 56 W	UNK	20
1249:46	33 29 13 N	118 26 58 W	UNK	19
1249:51	33 29 15 N	118 26 56 W	2,200	15
1249:56	33 29 15 N	118 26 60 W	CST	15
1250:00	33 29 15 N	118 27 01 W	CST	15
1250:05	33 29 14 N	118 27 03 W	CST	15

PERSONNEL INFORMATION

Flight Instructor

The flight instructor held an instructor certificate for single-engine airplanes. He was an airline transport pilot with a multi-engine airplane rating, and a commercial pilot with a single-engine

airplane rating. He was also type-rated in Learjet 60 airplanes. He was issued a first-class medical certificate on July 21, 2005, without any limitations or restrictions.

A review of his logbook revealed he accumulated a total of 2,309 hours of flight time. He logged about 776 hours in multi-engine airplanes, and 1,524 hours in single-engine airplanes. The flight school where he was employed estimated that he accumulated at least 250 hours in the accident airplane make and model. His logbook revealed that in the last 30 days he logged 95 total flight hours, of which 17 were in the same make and model as the accident airplane.

The instructor pilot was in the right seat during the flight.

Student

The student had a private pilot license with a single-engine airplane rating. His last medical certificate was obtained in September 1999. According to him, he logged about 310 hours of total flight time.

The student was in the left seat during the flight.

AIRCRAFT INFORMATION

The Avions Robin R.2160 is an all-metal, two-seat airplane, built in France. The airplane is equipped with a 160 horsepower Lycoming O-320-A2D engine. Though it is certificated as an acrobatic airplane in France, in the US it receives an experimental certification.

A review of the approved flight manual (AFM) revealed that when the wing flaps are retracted, intentional spins are approved; however, no baggage should be carried. The AFM indicates that the loss of altitude per 1 turn spin is about 250 feet. Spins in the Avions Robin should be "entered from a power-off full stall with slight nose up attitude." The spin recovery technique listed in the manual indicates that the pilot should:

- Apply and maintain full opposite rudder
- Maintain stick back until rotation stops (stick back position accelerates the recovery).
- Ailerons neutral
- As rotation stops neutralize the rudder and smoothly recover from the dive. After 3 spin turns, recovery is performed in 3/4 of a turn.

A note following the spin recovery procedure indicates that "only one action is important: Keep the rudder fully in the opposite direction!" The AFM also indicates that in spins lasting longer than three turns, the engine may stop. For 4 turn spins (or more) recovery takes 1.5 turns.

Review of the aircraft's maintenance records revealed that the last annual inspection completed on the airframe/engine took place on December 22, 2004, at an airframe total time of 7,359.1 hours. On August 18, 2005, the airplane/engine underwent a 100-hour inspection at

an airframe total time of 7,555.01 hours, and an engine total-time-since-major-overhaul of 1,025.1 hours. As of the morning of the accident, the airplane had accumulated 7,562.1 hours.

WRECKAGE & IMPACT INFORMATION

The airplane and engine were not recovered following the accident due to the depth of the water at the point of impact and the inability to locate the wreckage. Small pieces of debris were recovered and examined, but they were of little pertinence.

The flight instructor's parachute was recovered and examined by an FAA inspector. According to his statement, he received the parachute after it had been placed in a plastic evidence bag and recovered from the Los Angeles County Coroner's Office. The canopy and suspension lines had been cut by recovery personnel near their attachment point to the harness. The parachute appeared to be a "normal" deployment. The pilot chute was attached to the parachute and was fully deployed. The ripcord was not in the cord housing, but was present and appeared to be in good condition. Due to the suspension lines being cut by recovery personnel, a determination of entanglement could not be made. There were no rubber bands present in the harness, pack, or on the suspension lines. The inspector noted that the parachute had been inspected and repacked 16 days prior to the accident, on August 15, 2005.

PATHOLOGICAL INFORMATION

The Los Angeles County Coroner's Office conducted an autopsy on the flight instructor. According to the autopsy report, there was a "deep laceration of the right upper chest extending to the right shoulder". The cause of death was due to multiple blunt traumatic injuries.

A toxicological test for drugs was conducted on the flight instructor. The results were positive for the following: Bupropion, bupropion metabolite, citalopram, n-desmethylcitalopram, and di-n-desmethylcitalopram detected in liver and urine.

ADDITIONAL INFORMATION

The wreckage has not been recovered as of this report's writing.

Flight instructor Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	35,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	July 1, 2005
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	October 1, 2004
Flight Time:	2309 hours (Total, all aircraft), 95 hours (Last 30 days, all aircraft)		

Pilot Information

Certificate:	Private	**Age:**	42,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 None	**Last FAA Medical Exam:**	September 1, 1999
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	310 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Avions Robin	**Registration:**	N216RN
Model/Series:	R.2160	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic; Experimental (Special)	**Serial Number:**	200
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	August 1, 2005 Annual	**Certified Max Gross Wt.:**	1764 lbs
Time Since Last Inspection:	7.7 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	7562.1 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	O-320-D2A
Registered Owner:	Roonie Two, Inc.	**Rated Power:**	160 Horsepower
Operator:	California Flight Center	**Operating Certificate(s) Held:**	None
Operator Does Business As:	California Flight Center	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LGB	**Distance from Accident Site:**	
Observation Time:	13:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.87 inches Hg	**Temperature/Dew Point:**	23°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Long Beach, CA (LGB)	**Type of Flight Plan Filed:**	None
Destination:	Catalina, CA (AVX)	**Type of Clearance:**	VFR
Departure Time:	12:21 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal, 1 Minor	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Minor	**Latitude, Longitude:**	33.488334,-118.451942

Administrative Information

Investigator In Charge (IIC):	Charnon, Nicole
Additional Participating Persons:	Dennis Fogarty; Federal Aviation Administration; Long Beach, CA Philippe Mauviot; BEA; Paris, France Jeff Pierson; Apex Aircraft; Darios, France
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Note:	
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