



National Transportation Safety Board Aviation Accident Final Report

Location:	Rayville, LA	Accident Number:	FTW03FA027
Date & Time:	11/01/2002, 1130 CST	Registration:	N1HV
Aircraft:	Aero Commander 500-B	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	3 Fatal
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

The twin-engine airplane was observed at a low altitude of approximately 1,000 feet agl performing power off stall maneuvers. The witness described the first stall maneuver initiation and recovery as "good." During the second stall maneuver, the nose rose higher than it did during the first maneuver, the right wing dropped, followed by a steep nose down attitude. The airplane rotated about one and one half revolutions before disappearing behind trees. Prior to ground impact, the witness heard the engines rev up. The purpose of the flight was to demonstrate the airplane to a prospective buyer. A radar and aircraft performance study indicated that the accident airplane departed the airport and began a series of heading, speed and altitude changes ultimately crashing 14.6 nautical miles east of the departure airport. During several time periods, calculations of the calibrated airspeed indicated a trend towards and below published stall speeds of 63 knots flaps extended and 71 knots flaps retracted. No structural or mechanical anomalies were observed during an examination of the airplane and engine.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot-in-command's failure to maintain adequate airspeed resulting in an inadvertent stall/spin.

Findings

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

Findings

1. (C) AIRSPEED(VS) - NOT MAINTAINED - PILOT IN COMMAND
2. STALL/SPIN - INADVERTENT - PILOT IN COMMAND

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

Findings

3. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On November 1, 2002, approximately 1130 central standard time, an Aero Commander 500-B airplane, N1HV, was destroyed when it impacted terrain while maneuvering near Rayville, Louisiana. The airplane was registered to a private individual and operated by the pilot. The airline transport pilot and both pilot rated passengers were fatally injured. Visual meteorological conditions prevailed, and a flight plan was not filed for the 14 Code of Federal Regulations Part 91 business flight. The purpose of the flight was to demonstrate the airplane to a prospective buyer. The flight departed the Monroe Regional Airport (MLU), Monroe, Louisiana, at 1109, for the local training area located southeast of the airport.

There were several witnesses that either heard the airplane or saw the airplane for a few seconds before it disappeared from their view. One witness, who was a private pilot, reported observing the airplane at a low altitude of approximately 1,000 feet agl performing power-off stall maneuvers. He described the first stall maneuver initiation and recovery as "good." The power was reduced, the nose pitched up, followed by an increase of power as the airplane recovered from the maneuver. During the second stall maneuver, the nose rose higher than it did during the first maneuver, the right wing dropped, followed by a steep nose down attitude. The airplane rotated about one and one half revolutions before disappearing behind trees. Prior to ground impact, the witness heard the engines rev up.

PERSONNEL INFORMATION

According to FAA records, the pilot-in-command, who was occupying the right front seat, held a commercial pilot certificate for airplane single-engine land and an airline transport pilot certificate for airplane multiengine land. He held a flight instructor certificate for airplanes. The pilot was issued a second class medical certificate on February 5, 2002. The medical certificate stipulated a limitation to wear corrective lenses for near and far vision while operating an aircraft. The pilot's flight logbook was not located, therefore, the date of his last biennial flight review, and time in make and model of the accident airplane could not be determined. FAA records indicate the pilot reported having accrued a total of 18,500 flight hours on his application for the above second class medical certificate.

According to FAA records, the pilot rated passenger, who was occupying the left front seat, held a private certificate for airplane single-engine land that was issued on May 19, 1998. The passenger held a valid third class medical certificate, issued June 16, 2000. A review of the passenger's flight logbook revealed that as of August 17, 2002, he had logged a total of 549.0 flight hours. His most recent biennial flight review was completed on April 27, 2000.

AIRCRAFT INFORMATION

The 1960-model Aero Commander 500B (Twin Commander), serial number 500B-950-16, was a twin-engine, low wing, retractable landing gear, semimonocoque construction airplane. The airplane was powered by two fuel injected six-cylinder, air-cooled, horizontally opposed, Lycoming IO-540-B1A5 (serial number L-326-48 and L-252-48) engines, rated at 290 horsepower. The airplane was configured to carry a maximum of eight occupants.

The airplane was issued a standard airworthiness certificate on September 22, 1960, and was certificated for normal category operations. The airplane's current registration was issued on

July 2, 1999. A review of the maintenance logbooks revealed that on August 31, 1992, both engines underwent a major overhaul. On September 16, 1992, the engines were installed on the accident airplane at a total airframe time of 8,289 hours. The airplane underwent its most recent annual inspection on January 16, 2002, at a total airframe time of 8881.8 hours and engine time since overhaul of 592.7 hours.

METEOROLOGICAL INFORMATION

At 1153, the weather observation facility at the Monroe Regional Airport, located 15 nautical miles west of the accident site, reported the wind from 010 degrees at 8 knots, sky clear, temperature 53 degrees Fahrenheit, dew point 43 degrees Fahrenheit, and altimeter 30.40 inches of Mercury.

WRECKAGE IMPACT INFORMATION

The accident site was located using a global positioning satellite (GPS) receiver at 32 degrees 30 minutes 38.3 seconds north latitude and 091 degrees 45 minutes 01.1 seconds west longitude. The accident site was in an open field within the Floy Ward McElroy Wildlife Management Area, approximately 1.7 miles north of Rayville. Ground scars and signatures on the airframe indicated that the airplane impacted the ground in a near wings level at an approximate 30 degrees nose down attitude on a magnetic heading of 120 degrees. The airplane traveled 143 feet shedding the left and right propellers, nacelle sections, lower fuselage sections and engine components before coming to rest. The main wreckage consisted of the wings minus the left aileron, which was found at the initial ground scar, the cabin and cockpit sections, and empennage. The wings were found inverted with the leading edge facing toward the initial point of ground impact. Both main landing gear, engines and flight controls, except the left aileron, were found to be either still attached or partially attached to the wing. The cabin and cockpit were crushed and fragmented. The empennage was on top of the cabin and cockpit. The rudder, left elevator and right elevator remained attached or partially attached to the empennage with the trailing edges facing the initial point of impact. Due to the extent of damage, full control continuity could not be established. Elevator, rudder, elevator trim and rudder trim control cables were found intact through the empennage.

The right propeller was separated from the crankshaft with the propeller flange attached. Blade #1 displayed aft bending approximately 6 inches inboard from the blade tip. There was polishing and gouging at the blade tip. Blade #2 displayed aft bending and twisting toward low pitch at mid-blade. The blade tip was cracked from the leading edge to the trailing edge. The blade displayed polishing and gouging. Blade #3 displayed polishing, "S" bending, and the outboard 6 inches of the blade tip was separated.

The left propeller was separated from the crankshaft with the propeller flange attached. Blade #1 displayed aft bending and twisting toward low pitch, with polishing on the back of the blade. Blade #2 displayed aft bending and twisting toward low pitch. Trailing and leading edges displayed polishing and gouging. The blade was separated from the propeller hub. Blade #3 displayed "S" bending, polishing, and leading edge gouging. The blade was separated from the propeller hub.

Both engines were removed from the airplane and examined. Thumb compression and suction were observed on both engines and valve train continuity was established. All cylinders were inspected using a lighted bore scope, and no defects were noted. No anomalies were noted during the examination that would have precluded these engines from making power prior to

ground impact.

MEDICAL AND PATHOLOGICAL INFORMATION

The Forensic Pathologists, Inc., Bossier City, Louisiana, conducted an autopsy of the pilot. No evidence was found of any preexisting disease that could have contributed to the accident. Toxicological testing was performed by the FAA Civil Aeromedical Institute's (CAMI) Forensic Toxicology and Accident Research Center at Oklahoma City, Oklahoma. Toxicological tests found 30 (mg/dl, mg/hg) Ethanol detected in kidney and 66 (mg/dl, mg/hg) Ethanol detected in muscle; 11 (mg/dl, mg/hg) Acetaldehyde detected in kidney; 5 (mg/dl, mg/hg) Isopropanol detected in kidney and 28 (mg/dl, mg/hg) Isopropanol detected in muscle; 3 (mg/dl, mg/hg) N-Butanol detected in kidney and 5 (mg/dl, mg/hg) N-Butanol detected in muscle; 1 (mg/dl, mg/hg) N-Propanol detected in kidney and 2 (mg/dl, mg/hg) N-Propanol detected in muscle. The toxicology report noted that the ethanol found may be from postmortem formation and not from the ingestion.

The Forensic Pathologists, Inc., Bossier City, Louisiana, conducted an autopsy of the pilot rated passenger. No evidence was found of any preexisting disease that could have contributed to the accident. Toxicological testing was performed by the FAA Civil Aeromedical Institute's (CAMI) Forensic Toxicology and Accident Research Center at Oklahoma City, Oklahoma. Toxicological tests found 37 (mg/dl, mg/hg) Ethanol detected in kidney and 68 (mg/dl, mg/hg) Ethanol detected in muscle; 7 (mg/dl, mg/hg) Acetaldehyde detected in kidney; 1 (mg/dl, mg/hg) Isopropanol detected in kidney and 11 (mg/dl, mg/hg) Isopropanol detected in muscle; 6 (mg/dl, mg/hg) N-Butanol detected in kidney and 35 (mg/dl, mg/hg) N-Butanol detected in muscle; 3 (mg/dl, mg/hg) N-Propanol detected in kidney and 8 (mg/dl, mg/hg) N-Propanol detected in muscle. The toxicology report noted that the ethanol found may be from postmortem formation and not from the ingestion.

TESTS AND RESEARCH

A radar and aircraft performance study was accomplished by the NTSB's Office of Research and Engineering. The result of the study indicate that the accident airplane departed from MLU heading southeast, began a series of heading, speed and altitude changes ultimately crashing 14.6 nautical miles east of the departure airport. During several time periods, calculations of the calibrated airspeed (CAS) indicated a trend towards and below published stall speeds (63 knots flaps extended and 71 knots flaps retracted).

The flight began with a climb to about 2,800 feet msl and then with a series of stair step climbs to 3,300 feet where the altitude was maintained for about a minute until about 11:17:30, when the CAS dropped followed by an altitude drop of about 400 feet 30 seconds later, a possible indication of a stall. Immediately following there was another speed decrease and altitude increase, an indication of an exchange of speed for altitude. The flight then continued with a series of stair step altitude decreases from about 3,400 feet to 2,400 feet. Shortly after at 11:26:00, five minutes before the crash, the aircraft began a climb from 1,900 feet to 2,900 feet while the CAS hovered approximately between 50 to 80 knots in the vicinity of the stall speeds of 63 and 71 knots, for flaps extended and flaps retracted, respectively. At the end of this period, about 11:28:00, there was a speed drop followed by a 300 foot altitude drop, another possible stalling of the aircraft, and immediately followed by an altitude and speed increase. Finally, about 11:30:30, the speed dropped again as the airplane was lost from the radar at an altitude of 1,900 feet.

ADDITIONAL DATA

The aircraft wreckage was released to the owner's representative on November 4, 2002.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	65, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Single-engine	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	02/05/2002
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	18500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Aero Commander	Registration:	N1HV
Model/Series:	500-B	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	500B-950-16
Landing Gear Type:	Retractable - Tricycle	Seats:	8
Date/Type of Last Inspection:	01/16/2002, Annual	Certified Max Gross Wt.:	6750 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:	8881.8 Hours as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	IO-540-B1A5
Registered Owner:	Robin Williams	Rated Power:	290
Operator:	James C. Rogers	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	MLU, 79 ft msl	Distance from Accident Site:	15 Nautical Miles
Observation Time:	1153 CST	Direction from Accident Site:	264°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	10°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.4 inches Hg	Temperature/Dew Point:	12° C / 6° C
Precipitation and Obscuration:			
Departure Point:	Monroe, LA (MLU)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	VFR
Departure Time:	1109 CST	Type of Airspace:	Class E

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	2 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Fatal	Latitude, Longitude:	32.510556, -91.750278

Administrative Information

Investigator In Charge (IIC):	Douglas D Wigington	Report Date:	03/02/2004
Additional Participating Persons:	Lamont Williford; FAA FSDO; Baton Rouge, LA John B Butler; Lycoming; Williamsport, PA Geoffrey A Pence; Twin Commander Aircraft Corporation; Arlington, WA		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).