



Aviation Investigation Final Report

Location:	Medford, New Jersey	Accident Number:	NYC01FA169
Date & Time:	July 10, 2001, 12:58 Local	Registration:	N9616U
Aircraft:	Grumman American AA-1C	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

According to a witness, the airplane was observed making a steep turn to a right base. During the turn, the airplane's tail abruptly went up, and the airplane entered a 2 1/2 spin to the right prior to impacting the ground. There was no evidence of a pre-existing mechanical failure or malfunction. According to the FAA publication Airplane Flying Handbook, section on accelerated stalls and cross control stalls, "...Stalls which result from abrupt maneuvers tend to be more rapid, or severe, than the unaccelerated stalls, and because they occur at higher-than-normal airspeeds, they may be unexpected by an inexperienced pilot. Failure to take immediate steps toward recovery when an accelerated stall occurs may result in a complete loss of flight control, notably, power-on spins... a cross control stall...is most apt to occur during a poorly planned and executed base-to-final approach turn...the airplane often stalls with little warning. The nose may pitch down, the inside wing may suddenly drop and the airplane may continue to roll to an inverted position...It is imperative that this type of stall not occur during an actual approach to a landing since recovery may be impossible prior to ground contact due to the low altitude..."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper use of the flight controls while turning to base, which resulted in a stall/spin and subsequent impact with the ground.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: APPROACH - VFR PATTERN - BASE TURN

Findings

1. (C) FLIGHT CONTROLS - IMPROPER USE OF - 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 - OPEN FIELD

Factual Information

HISTORY OF FLIGHT

On July 10, 2001, at 1258 eastern daylight time, a Grumman American AA-1C, N9616U, was destroyed when it struck the ground, while on approach to the South Jersey Regional Airport (VAY), Medford, New Jersey. The certificated private pilot and the passenger were fatally injured. Visual meteorological conditions prevailed for the personal flight. No flight plan had been filed for the flight that was conducted under 14 CFR Part 91.

The flight originated from Northeast Philadelphia Airport (PNE), Philadelphia, Pennsylvania. The pilot had rented the airplane from an operator on the airport, and departed at 1245.

A witness in another airplane, who observed the accident from the air, reported that the winds were from 260 degrees at 6 knots. He further stated:

"...As I reached the South Jersey Airport, I was approximately 3 miles to the north side of runway 26 heading upwind at 1,500 feet preparing to enter a right downwind for runway 26. While looking for traffic in the pattern and general area, I observed two planes. The first was a Cessna already on a right downwind for runway 26 at approx 900 feet, 1/2 mile to the side of the runway. The second was a Grumman passing from my right to left off the departure end of runway 26 at approximately 1,800 feet.

I was on the radio frequency of 122.8 (Unicom) when the Cessna announced they were downwind for 26, South Jersey. At the time, I started a left turn toward runway 26 to enter a right downwind for runway 26 and started my descent to 900 feet.

As I was approaching downwind at midpoint, I saw the Grumman in a right descending turn, heading back toward the South Jersey Airport. I, at this time announced 'Cherokee entering right downwind runway 26, South Jersey.' Almost immediately after that, I heard the Grumman announce, 'Camouflage Grumman entering right base runway 26 South Jersey'. That statement is what brought my attention to the Grumman since I saw no other plane in the pattern and he was actually in the position of a right base for runway 8. Now, slightly lower than myself at approx. 800 feet. I watched the Grumman out of window as he continued to cross the end of runway 26. At that time, I turned downwind to runway 26 at 900 feet, approx. 1/2 mile to the side of the runway. Again, I announced 'Cherokee on right downwind runway 26 South Jersey'. Still paying attention out of my right window to the Grumman, which was now also on a right downwind, still descending and overtaking me between the runway and myself. He disappeared under my right wing. At that time, I announced, 'Cherokee turning left 360 to give way to the Camouflage Grumman on right downwind'. He acknowledged 'Roger That.'

As I completed my turn, the Grumman was now well in front of me and at an altitude of approx. 300 feet. He appeared to be just outside the tree line that borders the runway, (approx. 100 yards.) As I watched him, I was anticipating that he was going to initiate a climb since he was in no position to execute a right turn to the runway. Then he announced 'Grumman turning right base'. Personally, I was in disbelief he was going to attempt to land on runway 26.

I saw him enter a steep turn to the right and immediately enter a spin. I counted what I thought was two and one half revolutions to the right before impact."

The pilot reported that he initiated a go-around, and made radio calls, first on UNICOM frequency, and then to Philadelphia approach control about the accident, after which, he landed.

In a follow-up telephone interview, the witness reported that the airplane's angle of bank was steep, in excess of 60 degrees or greater, as it turned onto base leg, and the movement of the tail up was abrupt.

Another witness was preparing a helicopter for departure from the airport. He reported that he first saw the airplane on what he described as a low, close in downwind, about 400 to 500 feet high, and about 1/4 mile laterally from the runway, in a shallow descent, moving fast. He did not hear the engine and did not observe the crash. However, after hearing the radio call about the crash, he departed and landed near the accident site in his helicopter. He reported that he could smell fuel at the accident site. He also reported that the winds were straight down the runway, about 10 knots and steady.

The accident occurred during the hours of daylight, in the vicinity of 39 degrees, 56.91 minutes north latitude, 74 degrees, 49.95 degrees west longitude.

PERSONNEL INFORMATION

The pilot held a private pilot certificate, which he received on October 26, 1990. At that time, his logbook showed his total flight experience was 141.8 hours, with 36.3 hours as pilot-in-command.

The pilot's logbook contained entries through June 11, 2001. According to records from the operator where the airplane was rented, that date was the pilot's last flight prior to the accident flight. According to the pilot's logbook, he had a total flight experience of 318.9 hours with 202.2 hours as pilot-in-command, and 13.8 hours in make and model. His logbook also noted 3.9 hours of flight experience in the preceding 90 days, none in make and model. In addition, he had logged 5 takeoffs and landings in category and class in the preceding 90 days.

The pilot logged 14.2 hours in the preceding 12 months. The pilot's last flight review was on February 27, 2000.

The pilot's most recent FAA third class medical certificated was dated November 14, 2000.

AIRCRAFT INFORMATION

The airplane had side-by-side seating with functioning dual flight controls available to the occupants of both seats. The power controls were located on the lower center instrument panel. The fuel selector was on the floor, forward and between the two seats.

AIRPORT INFORMATION

South Jersey Regional Airport had a single asphalt runway, which was 3,911 feet long and 50 feet wide.

WRECKAGE AND IMPACT INFORMATION

The airplane was examined at the accident site on July 10 and 11, 2000. The airplane came to rest in a soybean field, in a nose-down attitude of about 60 degrees, with the leading edges of both wings crushed rearward. There was a vertical compression wrinkle on the left side of the fuselage, abeam the trailing edge of the wings.

Emergency personnel reported a smell of fuel at the accident site, and fuel had also been reported leaking from the airplane after the accident.

The airplane was moved from the accident site to a hangar at the airport for further examination.

The wing flap jackscrew was in a position that corresponded to full flap extension, and both wing flaps were in the fully-extended position.

There was no fuel in the right wing fuel tank; however, fuel was found in the line from the right tank to the fuel selector. Fuel was also found in the left wing fuel tank. The fuel selector was in the off position.

The fiberglass wing tip on the left wing was bent downward. There was dirt in the metal glare shield located above the top of the left wing navigation light. A compression ridge was on the underside of the left wing, and was more pronounced closer to the wing tip. The fiberglass wing tip on the right wing was bent up. The glare shield on the navigation light contained a compression wrinkle on the topside. There were no compression wrinkles on the underside of the right wing.

Both blades of the propeller were bent rearward. On the leading edge of one blade was an indentation, which measured about 1/2 inch deep and 2 inches wide, located 2 inches from the tip. The paint on the front of the both propeller blades was worn off, and chordwise scratches were found where the paint was missing.

The engine was rotated through the vacuum pump drive. Camshaft, crankshaft, and valve train continuity was confirmed, and thumb compression was attained on all four cylinders. The engine oil screen was removed for inspection, and was absent of debris.

The carburetor throttle body was about 1/4 open, and the mixture valve was in the full rich position. The carburetor heat box was distorted, and found in the mid-range position. There was a single piece venturi in the carburetor, which was in place. The carburetor was equipped with plastic floats. The carburetor fuel filter and main jet were absent of debris. About 1 ounce of liquid, blue in color, and similar in odor to 100 LL aviation grade gasoline, was found in the bottom of the carburetor bowl. The carburetor bowl was absent of debris.

The aft end of both magnetos were destroyed, and could not be tested. When the engine was rotated, the impulse coupling on the left magneto was heard to click.

All flight control cables were intact. The elevator trim was in the neutral position. In the cockpit, both control yokes were bent to the left. The throttle was bent left with 1 1/2 inches of throttle shaft exposed. The mixture and carburetor heat controls were found full forward.

All seatbelt and shoulder harness attach points were secure. Examination of both shoulder harness adjustment straps found no distortion on the belt under the adjustment roller. Both lap belts were attached to their fuselage sidewall attach points. The right seat belt was separated 31 inches from its fuselage sidewall attach point, and the left seat belt was separated 33 inches from its fuselage sidewall attach point.

MEDICAL AND PATHOLOGICAL INFORMATION

On July 10, 2001, autopsies were conducted on the occupants by the Medical Examiner for Burlington County, State of New Jersey. Toxicological testing of the pilot, conducted at the Federal Aviation Administration (FAA) Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma, was negative for alcohol. However, the drugs ephedrine and pseudoephedrine were detected in his blood and urine, and phenylpropanolamine was detected in his blood.

ADDITIONAL INFORMATION

According to FAA publication 8083-3, Airplane Flying Handbook, Chapter 5, Slow Flight Stalls and Spins:

"Accelerated Stalls

...the pilot must thoroughly understand that all stalls result solely from attempts to fly at excessively high angles of attack...At the same gross weight, airplane configuration, and power setting, a given airplane will consistently stall at the same indicated airspeed if no acceleration is involved. The airplane will, however, stall at a higher indicated airspeed when excessive

maneuvering loads are imposed by steep turns, pullups, or other abrupt changes in its flightpath...Stalls which result from abrupt maneuvers tend to be more rapid, or severe, than the unaccelerated stalls, and because they occur at higher-than-normal airspeeds, they may be unexpected by an inexperienced pilot. Failure to take immediate steps toward recovery when an accelerated stall occurs may result in a complete loss of flight control, notably, power-on spins...."

"When the airplane stalls, recovery should be made promptly, by releasing sufficient back-elevator pressure and increasing power to reduce the angle of attack. If an uncoordinated turn is made, one wing may tend to drop suddenly, causing the airplane to roll in that direction. If this occurs, power must be added, the excessive back-elevator pressure released, and the airplane returned to straight-and-level flight with coordinated control pressure."

"Cross-Control Stall

This type of stall occurs with the controls crossed-aileron pressure applied in one direction and rudder pressure in the opposite direction...In addition, when excessive back-elevator pressure is applied, a cross-control stall may result.

This is a stall that is most apt to occur during a poorly planned and executed base-to-final approach turn, and often is the result of overshooting the centerline of the runway during that turn. Normally, the proper action to correct for overshooting the runway is to increase the rate of turn by using coordinated aileron and rudder. At the relatively low altitude of a base-to-final approach turn, improperly trained pilots may be apprehensive of steepening the bank to increase the rate of turn, and rather than steepening the bank, they hold the bank constant and attempt to increase the rate of turn by adding more rudder pressure in an effort to align it with the runway.

The addition of inside rudder pressure will cause the speed of the outer wing to increase therefore, creating greater lift on that wing. To keep that wing from rising and to maintain a constant angle of bank, opposite aileron pressure needs to be applied. The added inside rudder pressure will also cause the nose to lower in relation to the horizon. Consequently, additional back-elevator pressure would be required to maintain a constant-pitch attitude. The resulting condition is a turn with rudder applied in one direction, aileron in the opposite direction, and excessive back-elevator pressure-a pronounced cross-control condition.

Since the airplane is in a skidding turn during the cross-control condition, the wing on the outside of the turn speeds up and produces more lift than the inside wing; thus, the airplane starts to increase its bank. The down aileron on the inside of the turn helps drag that wing back, slowing it up and decreasing its lift, which requires more aileron application. This further causes the airplane to roll. The roll may be so fast that it is possible the bank will be vertical or past vertical before it can be stopped.

In a cross-control stall, the airplane often stalls with little warning. The nose may pitch down,

the inside wing may suddenly drop, and the airplane may continue to roll to an inverted position. This is usually the beginning of a spin. It is obvious that close to the ground is no place to allow this to happen.

Recovery must be made before the airplane enters an abnormal attitude (vertical spiral or spin); it is a simple matter to return to straight-and-level flight by coordinated use of the controls. The pilot must be able to recognize when this stall is imminent and must take immediate action to prevent a completely stalled condition. It is imperative that this type of stall not occur during an actual approach to a landing, since recovery may be impossible prior to ground contact due to the low altitude."

The aircraft wreckage was released to the airport manager on July 11, 2001.

Pilot Information

Certificate:	Private	Age:	66, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medical-w/ waivers/lim	Last FAA Medical Exam:	November 14, 2000
Occupational Pilot:	UNK	Last Flight Review or Equivalent:	February 27, 2000
Flight Time:	319 hours (Total, all aircraft), 14 hours (Total, this make and model), 202 hours (Pilot In Command, all aircraft), 4 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Grumman American	Registration:	N9616U
Model/Series:	AA-1C	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	AA1C0074
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	June 4, 2001 Annual	Certified Max Gross Wt.:	1600 lbs
Time Since Last Inspection:	84 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	3531 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	O-235-L2C
Registered Owner:	Waldo S. Steen	Rated Power:	115 Horsepower
Operator:	Hortman Aviation Services	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	WRI,133 ft msl	Distance from Accident Site:	11 Nautical Miles
Observation Time:	12:55 Local	Direction from Accident Site:	262°
Lowest Cloud Condition:	Scattered / 5000 ft AGL	Visibility	7 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	12 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.73 inches Hg	Temperature/Dew Point:	34°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Philadelphia, PA (PNE)	Type of Flight Plan Filed:	None
Destination:	Medford, NJ (VAY)	Type of Clearance:	None
Departure Time:	12:45 Local	Type of Airspace:	Class G

Airport Information

Airport:	South Valley Regional VAY	Runway Surface Type:	Asphalt
Airport Elevation:	53 ft msl	Runway Surface Condition:	Dry
Runway Used:	26	IFR Approach:	None
Runway Length/Width:	3911 ft / 50 ft	VFR Approach/Landing:	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	39.948333,-74.832496

Administrative Information

Investigator In Charge (IIC): Hancock, Robert

Additional Participating Persons: Orton J Ogborn; Federal Aviation Administration; Philadelphia, PA
Bart Ritorto; New Jersey Division of Aeronautics; Trenton, NJ
David Moore; Textron Lycoming; Williamsport, PA

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Last Revision Date:

Investigation Class: [Class](#)

Note:

Investigation Docket: <https://data.nts.gov/Docket?ProjectID=52661>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).