# Aviation Investigation Final Report

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| **Location:** | Euharlee, Georgia | **Accident Number:** | ATL04FA190 |
| **Date & Time:** | September 21, 2004, 19:32 Local | **Registration:** | N801SP |
| **Aircraft:** | Piper PA-32R-301 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | | **Injuries:** | 2 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Instructional | | |

## Analysis

According to the president of Aero Atlanta Flight Center, the purpose of the flight was for one flight instructor to provide a "check-out" flight to the second flight instructor, so that the second flight instructor could begin training students in the PA-32R-301. The flight center president stated that such a flight would typically include the performance of normal and emergency procedures, landings, slow flight, stalls, and steep turns. A witness outside about two miles from the accident site reported hearing an airplane engine noise that sounded "wide open." He stated he then heard two very loud pops, then there was silence. A pilot and mechanic-rated witness reported the airplane sounded "... like it was doing a loop or some kind of high G-load maneuver." Witnesses reported they saw the airplane fall out of the sky in pieces. Examination revealed no evidence of mechanical malfunction of the engine, propeller, or flight controls. Examination revealed the outboard sections of both wings and the stabilator were separated. Fracture surfaces from the left wing main spar, the right wing main spar, and the stabilator were sent to the National Transportation Safety Board, Office of Research and Engineering, Materials Laboratory Division, Washington, D. C., for metallurgical examination. The laboratory report stated there was no evidence of pre-existing cracking or damage, and the fracture characteristics were consistent with overstress separations. The report stated, "Fracture, damage, and deformation patterns indicated upward loading on both wings at the time of fracture. ... Fracture, damage, and deformation patterns on the horizontal stabilator indicated downward bending overstress separations ... ."

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain adequate control of the airplane, which resulted in the pilot exceeding the design limits of the airplane and subsequent in-flight separation.

## Findings

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

Findings
1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
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Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: DESCENT - UNCONTROLLED

Findings
2. (C) AIRFRAME - OVERLOAD
3. (C) DESIGN STRESS LIMITS OF AIRCRAFT - EXCEEDED - PILOT IN COMMAND
4. (C) AIRFRAME - SEPARATION
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. TERRAIN CONDITION - GROUND

## Factual Information

HISTORY OF FLIGHT

On September 21, 2004, at 1932 eastern daylight time, a Piper PA-32R-301, N801SP, registered to Letch Properties, Inc., and operated by Aero Atlanta Flight Center, broke apart in flight while maneuvering in the vicinity of a private airstrip in Euharlee, Georgia. The instructional flight was operated under the provisions of Title 14 CFR Part 91 with no flight plan filed. Visual meteorological conditions prevailed. The two certificated flight instructors received fatal injuries, and the airplane sustained substantial damage. The local flight departed Cobb County - McCollum Field, Kennesaw, Georgia, about 1915 on September 21, 2004.

According to the president of Aero Atlanta Flight Center, the purpose of the flight was for one flight instructor to provide a "check-out" flight to the second flight instructor, so that the second flight instructor could begin training students in the PA-32R-301. The flight center president stated that such a flight would typically include the performance of normal and emergency procedures, landings, slow flight, stalls, and steep turns.

A witness outside about two miles from the accident site reported hearing an airplane engine noise that sounded "wide open." He stated he has heard other airplanes maneuver in the area before, and this noise was the "highest revving sound" he has ever heard. He stated he then heard two very loud pops, then there was silence. The witness looked for the airplane but did not see it. A pilot and mechanic-rated witness reported he "heard the engine slow down then speed up and start popping, then [it] stopped. Sounded to me like it was doing a loop or some kind of high G-load maneuver." He looked up and saw pieces of the airplane fluttering to the ground. The witness stated he immediately telephoned the local 911 operator to report the accident. Witnesses and emergency response personnel found the fuselage of the airplane inverted in a field with pieces of the wings and empennage scattered across adjacent woods and fields.

PERSONNEL INFORMATION

The flight instructor providing the check-out held a commercial pilot certificate and flight instructor certificate for airplane single-engine land, airplane multi-engine land, and instrument airplane. He held a first-class medical certificate dated March 2004 with no restrictions or limitations. A review of his pilot logbook revealed he logged 518.7 total flight hours, which included 444.1 hours as pilot-in-command, 124.5 hours in high-performance airplanes, 155.1 hours in complex airplanes, and 140 hours as flight instructor.

The flight instructor receiving the check-out held a commercial pilot certificate and flight instructor certificate for airplane single-engine land and instrument airplane, and he held an

advanced ground instructor certificate. He held a first-class medical certificate dated June 2003 with no restrictions or limitations. A review of his pilot logbook revealed he logged 1002.6 total flight hours, which included 960.9 hours as pilot-in-command, 87.7 hours in complex airplanes, and 691.2 hours as flight instructor.

## AIRCRAFT INFORMATION

The Piper PA-32R-301 was manufactured in 1980 and powered by a Lycoming IO-540-K1G5D 300-horsepower engine. The airplane was equipped with a McCauley B3D36C433/80VSA-1 three-bladed propeller in accordance with Supplemental Type Certificate SA433CH. A review of maintenance logbooks revealed a 100-hour inspection of the airplane was completed on July 30, 2004, at an airframe total time of 3961.18 hours and hobbs meter reading of 626.6 hours. The readings on the tachometer and the hobbs meter at the accident site could not be determined. Records provided by the operator recorded a tachometer reading of 4060.4 and a hobbs meter reading of 733.1 when the airplane was dispatched for the flight. A review of records from a fueling facility revealed the airplane was topped off with 86.7 gallons of 100LL avgas prior to departure.

## WRECKAGE AND IMPACT INFORMATION

Examination of the accident site revealed the engine, propeller, and the fuselage with the inboard wings and flaps attached came to rest inverted in a field at the end of a wreckage debris line that extended 2,120 feet along a 142-degree magnetic heading. Wreckage debris was scattered across two fields and a wooded area between the two fields. The stabilator was separated and in two pieces in a field at the beginning of the wreckage debris line. The left aileron was separated and in two pieces in the field near the stabilator pieces; a crushed section of the right side of the empennage and the fiberglass cap from the left wingtip were also in the field. The outboard section of the left wing was in trees at the edge of the wooded area adjacent to the field in which the stabilator pieces were found. The separated right aileron and the outboard section of the right wing were found further southeast along the wreckage debris line in the woods.

The wreckage was recovered and transported to an examination facility, and the pieces were arranged in their respective locations for examination. Examination of the fuselage section revealed the instrument panel, cockpit, and cabin were crushed. The firewall was buckled and crushed aft at an approximate 60-degree angle. The cabin roof was displaced aft and crushed to the seat bases. The control yokes were attached and crushed, and the throttle quadrant was crushed. The empennage including the rudder, vertical stabilizer, and stabilator balance weight were separated and adjacent to the aft fuselage, hanging from a bundle of twisted control cables.

The vertical stabilizer was crushed, and a white-painted surface on the right side of the stabilizer showed red paint transfer marks. The two-foot section of the right side of the empennage that was retrieved from the field near the left aileron pieces was crushed, and a

white-painted area on the empennage piece showed red paint transfer marks. The rudder was attached to the vertical stabilizer, the rudder cables were attached to the rudder horn and were twisted, and the stops were in place. The stabilator was separated into two halves at the root, and the outboard sections of the trim tab were attached. The upper control cable for the stabilator balance weight was attached, the lower control cable was separated at the bracket, and the bracket was bent. The cables were twisted, and the stabilator stops were in place.

The inboard left wing was attached to the fuselage, the fuel tank and bladder cell were breached, and the main landing gear was retracted. The flap was attached at all hinges, and the pushrod was separated and bent. The approximate nine-foot section of the outboard wing that was retrieved from the trees was crushed and separated through the main spar, and a red-painted area on the wing showed white paint transfer marks. The fiberglass left wingtip cap that was retrieved from the field was crushed. The inboard four feet of the separated aileron was bent upward approximately 40 degrees. The aileron pushrod was separated and bent, the bellcrank was separated and bent, the control and balance cables were attached, and the stops were in place.

The inboard right wing was attached to the fuselage, the fuel tank and bladder cell were breached, and the main landing gear was retracted. The flap was attached at all hinges. The approximate nine-foot section of the outboard wing that was retrieved from the woods along the wreckage debris path was separated through the main spar. The separated aileron was bent up and aft. The aileron pushrod was separated and bent, the bellcrank was attached and bent, the control and balance cables were attached, and the stops were in place. The control cable and the balance cable were separated approximately four feet inboard of the bellcrank.

Examination of the engine at the accident site revealed the engine assembly remained attached to the firewall, the propeller hub was fractured and separated, and all three propeller blades were embedded in the ground adjacent to the propeller hub. Each propeller blade showed chordwise gouges on the camber side and along the leading edge. Examination of the engine at the recovery facility revealed the oil sump was breached, and the tops of the cylinders, the top spark plugs, and the pushrods were damaged. The crankshaft was rotated at the flange, and crankshaft continuity to the accessory drive gears was established, movement of the valve lifters was observed, and compression developed on all six cylinders. Borescope examination of the piston tops and valves revealed no abnormalities. The ignition harness was damaged, the dual magneto was separated, and the magneto produced spark on all towers when rotated. The bottom spark plugs displayed color and wear consistent with the "normal" condition on the Champion AV-27 comparison chart for massive electrode plugs. The oil suction screen and the oil filter were free of contaminants, and the oil cooler was crushed. The fuel servo was separated, the throttle and mixture arms were damaged, the inlet screen was free of contaminants. Residual fuel was found inside the fuel servo and in the fuel flow divider. The propeller governor was fractured, the control was damaged, and the gasket screen was free of contaminants. The vacuum pump flange was fractured, the pump was separated, and the shear drive was not located; the rotor and vanes showed circumferential scoring, and the rotor was fractured.

## MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the flight instructor providing the check-out flight by the Georgia Bureau of Investigations, Division of Forensic Sciences, Decatur, Georgia, on September 22, 2005. The report stated the cause of death was "multiple blunt force trauma." Forensic toxicology was performed by the Federal Aviation Administration, Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The report stated no carbon monoxide, no cyanide, no ethanol, and no drugs were detected in the blood.

An autopsy was performed on the flight instructor receiving the check-out flight by the Georgia Bureau of Investigations, Division of Forensic Sciences, Decatur, Georgia, on September 22, 2005. The report stated the cause of death was "multiple blunt force injuries." Forensic toxicology was performed by the Federal Aviation Administration, Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The report stated no carbon monoxide, no cyanide, no ethanol, and no drugs were detected in the blood.

## TESTS AND RESEARCH

Fracture surfaces from the left wing main spar, fracture surfaces from the right wing main spar, and the stabilator halves were sent to the National Transportation Safety Board, Office of Research and Engineering, Materials Laboratory Division, Washington, D. C., for metallurgical examination. The report prepared by the laboratory stated examination of the fracture surfaces revealed no evidence of pre-existing cracking or damage, and the fracture characteristics were consistent with overstress separations. The report stated, "Fracture, damage, and deformation patterns indicated upward loading on both wings at the time of fracture. ... Fracture, damage, and deformation patterns on the horizontal stabilator indicated downward bending overstress separations ... ."

## ADDITIONAL INFORMATION

A review of recorded radar data revealed a radar target with a transponder code of 1200 was observed east of Cobb County - McCollum Field at 1916:41 at the Mode C altitude of 1400 feet. The target was observed to climb and proceed west over Cartersville Airport, Cartersville, Georgia, at the Mode C altitude of 3400 feet. The target then proceeded northwest and climbed to the Mode C altitude of 4800 feet in the vicinity of the accident site. The last radar return at 1927:17 showed the target southeast of the accident site at an altitude of 4700 feet; an associated primary target was observed northeast of the accident site at 1927:27. A review of Bartow County 911 records revealed the first call to the 911 operator was recorded at 19:32:47.

The Pilot's Operating Handbook for the Piper Saratoga SP PA-32R-301 states in Section 2, Limitations, "2.17 Flight Load Factors (a) Positive Load Factor (Maximum) - 3.8 G, (b) Negative Load Factor (Maximum) - No inverted maneuvers approved." The handbook also states, "2.3

Airspeed Limitations ... Design Maneuvering Speed (Va) - Do not make full or abrupt control movements above this speed. At 3600 lbs GW - 134 KIAS, 132 KCAS. At 2230 lbs GW - 105 KIAS, 104 KCAS."

The wreckage was released to a representative of International Loss Management, Inc., Norcross, Georgia, on May 6, 2005.

## Flight instructor Information

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| **Certificate:** | Commercial; Flight instructor | **Age:** | 29,Male |
| **Airplane Rating(s):** | Single-engine land; Multi-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | Yes |
| **Instructor Rating(s):** | Airplane multi-engine; Airplane single-engine; Instrument airplane | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 1 Without waivers/limitations | **Last FAA Medical Exam:** | March 16, 2004 |
| **Occupational Pilot:** | | **Last Flight Review or Equivalent:** | July 4, 2003 |
| **Flight Time:** | 519 hours (Total, all aircraft), 444 hours (Pilot In Command, all aircraft), 36 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft) | | |

## Flight instructor Information

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|---|---|---|---|
| **Certificate:** | Commercial; Flight instructor | **Age:** | 26,Male |
| **Airplane Rating(s):** | Single-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; Instrument airplane | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 1 Without waivers/limitations | **Last FAA Medical Exam:** | June 20, 2003 |
| **Occupational Pilot:** | | **Last Flight Review or Equivalent:** | November 24, 2003 |
| **Flight Time:** | 1003 hours (Total, all aircraft), 961 hours (Pilot In Command, all aircraft), 51 hours (Last 30 days, all aircraft), 10 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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|---|---|---|---|
| **Aircraft Make:** | Piper | **Registration:** | N801SP |
| **Model/Series:** | PA-32R-301 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 32R-8013070 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 6 |
| **Date/Type of Last Inspection:** | July 30, 2004 100 hour | **Certified Max Gross Wt.:** | 3600 lbs |
| **Time Since Last Inspection:** | 99.6 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 3961.18 Hrs as of last inspection | **Engine Manufacturer:** | Lycoming |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | IO-540-K1G5D |
| **Registered Owner:** | Letch Properties, Inc. | **Rated Power:** | 300 Horsepower |
| **Operator:** | Aero Atlanta Flight Center | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | KVPC,759 ft msl | **Distance from Accident Site:** | 5 Nautical Miles |
| **Observation Time:** | 18:53 Local | **Direction from Accident Site:** | 131° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 3 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 140° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30.21 inches Hg | **Temperature/Dew Point:** | 22°C / 14°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Kennesaw, GA (KRYY) | **Type of Flight Plan Filed:** | None |
| **Destination:** | | **Type of Clearance:** | VFR |
| **Departure Time:** | 19:15 Local | **Type of Airspace:** | Class G |

## Airport Information

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| **Airport:** | Cobb County - McCollum Field KRYY | **Runway Surface Type:** | |
| **Airport Elevation:** | 1040 ft msl | **Runway Surface Condition:** | |
| **Runway Used:** | | **IFR Approach:** | None |
| **Runway Length/Width:** | | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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|---|---|---|---|
| **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:** | 34.171112,-84.924163 |

## Administrative Information

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| **Investigator In Charge (IIC):** | Gagne, Catherine |
| **Additional Participating Persons:** | Jim Couch; FAA Atlanta FSDO - 11; College Park, GA<br>Edward G Rogalski; Textron Lycoming; Bellview, FL<br>Robert P Martellotti; The New Piper Aircraft, Inc.; Vero Beach, FL |
| **Original Publish Date:** | July 7, 2005 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=60194 |