National Transportation Safety Board
Aviation Accident Final Report

Location:	UMPIRE, AR	**Accident Number:**	FTW99FA041
Date & Time:	12/02/1998, 1216 CST	**Registration:**	N501EZ
Aircraft:	Cessna 501	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

The certificated commercial pilot picked up his newly painted airplane for a visual flight to the home base. About 17 miles south of the departure airport, witnesses initially observed the airplane in a 90 degree right bank. It continued to roll to an inverted position while simultaneously nosing down to a near vertical descent. The pilot's second class medical certificate application (July 7, 1997) indicated 3,700 hours flight time. A flight log indicted the pilot flew this aircraft 6.4 hours during the 60 days preceding the accident. No evidence was found that the pilot had not obtained sufficient rest before the flight. There was no evidence found to either suggest a medical cause for incapacitation or to rule out incapacitation for medical reasons. Aircraft maintenance records did not reveal any open discrepancies. All of the airplane was accounted for in the wreckage debris. No evidence of an in-flight fire and/or explosion, or in-flight mechanical and/or flight control malfunction was found.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's in flight loss of control for undetermined reasons.

Findings

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

Findings
1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
2. (C) REASON FOR OCCURRENCE UNDETERMINED

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

Factual Information

HISTORY OF FLIGHT:

On December 2, 1998, at approximately 1216 central standard time, a Cessna 501 twin turbofan airplane, N501EZ, impacted terrain in a hilly wooded area near Umpire, Arkansas. The airplane was owned and operated by Yates Aviation Inc., Texarkana, Arkansas, under 14 Code of Federal Regulations (CFR) Part 91. The instrument rated commercial pilot, sole occupant of the airplane, received fatal injuries. The airplane was destroyed by impact forces and fire. Visual meteorological conditions prevailed for the planned 66.6 nautical mile cross-county business flight, which originated from the Mena Intermountain Municipal Airport, Mena, Arkansas, approximately 12 minutes prior to the accident. The flight's intended destination was the Texarkana Regional Airport, Texarkana, Arkansas, and a flight plan was not filed.

The airplane was purchased from Gantt Aviation, Inc., a fixed-base operator (FBO) at the Georgetown Municipal Airport, Georgetown, Texas, about 2 months before the accident flight. On November 16, 1998, the accident aircraft was flown from Gantt Aviation, Inc., to Goodner Aircraft Painting, Inc., Mena Intermountain Municipal Airport, by a sales representative employed by Gantt Aviation, Inc., for the purpose of having the aircraft repainted. During, and following, the 1.1 hour flight to Mena, there were no aircraft discrepancies reported by the sales representative. The registration number was changed during painting from N211X to N501EZ. An aircraft test flight was not conducted after the aircraft was painted.

On December 2, 1998, the accident pilot, the President of Yates Aviation, Inc., was flown from the company's home base at Texarkana Regional Airport to Mena to pick the aircraft up from Goodner Aircraft Painting, Inc., and fly it to the home base at Texarkana. The accident pilot arrived at Mena approximately 1150 via a Beech Baron. The accident pilot and the Baron pilot performed a walk around inspection of the Cessna 501 aircraft. Upon entering the cabin, and after looking in his flight case, the pilot commented that he could not find his radio headset. He then entered the cockpit of the aircraft and was heard to say "this will work."

Between 1202 and 1205, the engines were started and the pilot taxied N501EZ to runway 17 for takeoff. Following a 1-2 minute hold at the end of the runway, the airplane departed runway 17 for a direct flight to Texarkana. Witnesses stated that the takeoff was normal and there were no unusual pitch or roll oscillations of the aircraft.

When presented a map, witnesses near the site identified their location at about 1 mile west of Federal Airway V289 and on military instrument route IR164. These witnesses were on a north-south bend of the Cossatot River, facing east. About 1215, these witnesses reported hearing a jet airplane flying to the east of them traveling from north to south in the area of Umpire, Arkansas, about 17 miles south of Mena. They heard the airplane continue toward the south, circle around south of them and proceed toward the north, west of their location. They turned toward the west and saw the aircraft down the river at an unknown distance and altitude, in a 90 degree right bank. The aircraft continued to roll to an inverted position while simultaneously nosing down to a near vertical descent. The witnesses lost sight of the aircraft behind a hill, heard the impact explosion, saw the black smoke, and called 911. These witnesses reported that the engine sound was "constant and never changed" from when they first heard it. They further reported that the aircraft did not sound like the military jets they are use to seeing and hearing, and they heard no other aircraft, but the accident aircraft.

PERSONNEL INFORMATION:

The pilot obtained his first FAA certificate, the Private Pilot Certificate with the airplane single engine land rating, on October 22, 1976. The instrument rating was added on April 12, 1979. A multiengine land rating was obtained on March 31, 1980, in a Beech BE-58 airplane. In March 1981, the multiengine and instrument ratings were upgraded to a Commercial Pilot Certificate. The pilot obtained the Cessna 500 type rating on May 9, 1991, in a Cessna 501 airplane. The pilot's Commercial Pilot Certificate was last updated on December 13, 1993, when the Mitsubishi 300 and Beech 400 type ratings were added.

The 57-year-old pilot held an FAA second class medical certificate, issued July 7, 1997, with the limitation that the "holder shall possess glasses that correct for intermediate and near vision" while exercising the privileges of his pilot certificate. The medical application for this second class medical certificate indicated 3,700 hours total flight time with 75 hours in the previous 6 months. Pilot logbook records were not located. A card found in the pilot's wallet after the accident showed the pilot received a pilot proficiency check (CFR Part 61.58) in the Cessna 501 on November 19, 1995.

The aircraft flight log for N501EZ showed that the accident pilot first flew the aircraft on October 2, 1998, from Dallas, Texas, to Texarkana, Arkansas. On October 6, 1998, the pilot flew the aircraft from Texarkana to Atlanta, Georgia, and returned to Texarkana. On November 4, 1998, the pilot flew the aircraft from Texarkana to Austin, Texas, and then to Texarkana, with a diversion to Shreveport due to the weather at Texarkana. The aircraft flight log indicated the pilot flew N501EZ a total flight time of 6.4 hours during the 60 days preceding the accident flight.

Interviews with company personnel and acquaintances disclosed that the pilot was the chairman and chief executive officer of the convenience store chain, E-Z Mart Stores, Inc. The pilot was a member of the Arkansas Aviation Aerospace Commission. Interviews disclosed no evidence of any activities that would have prevented the pilot from obtaining sufficient rest in the 72 hours before the accident.

AIRPLANE INFORMATION:

N501EZ, a Cessna 501 Citation (certified for single pilot operation), serial number 0058, was issued an airworthiness certificate on April 20, 1978. The airplane was configured to carry eight passengers and two pilots and was equipped with two Pratt & Whitney (P & W) model JT15D-1A turbofan engines rated at 2,200 pounds of thrust per engine. Registration to the current owner, Yates Aviation, Inc., was dated October 22, 1998.

The Cessna/Citation Operating Manual limitations for single pilot operations include in part: "1 boom microphone or headset mounted microphone." The operating manual states in part: "The pilot-in-command must have a C-500 Type Rating and meet the requirements of FAR 61.58 for two-pilot operation or FAR 61.57 for single pilot operation (Model 501 only)."

The aircraft maintenance records indicated that the airframe had accumulated 5,874.3 flight hours and 5,436 flight cycles as of November 16, 1998. The left engine was a P & W JT15D-1A, two spool, turbofan engine, S/N PC-E 76944. Maintenance records indicated that the left engine had accumulated a total of 5,508.0 flight hours and 4,949 flight cycles as of November 16, 1998. The right engine was a P & W JT15D-1A, two spool, turbofan engine, S/N PC-E 76952. Maintenance records indicated that the right engine had accumulated a total of 5,831.0 flight hours and 5,397 flight cycles as of November 16, 1998. No evidence of any uncorrected

discrepancies was found in the maintenance records.

Final maintenance performed on the accident airplane was initiated at Goodner Aircraft Painting, Inc. An incoming aircraft inspection report, dated November 17, 1998, reveled two discrepancies upon acceptance of the airplane: 1. Scratches on the side windows. 2. Scratches on the windshield. According to a logbook entry, dated December 2, 1998, the airplane was "stripped and repainted according to manufacturer specifications. Flight controls balanced in accordance with manufacturer's specifications and/or AD note."

METEOROLOGICAL INFORMATION:

All times are central standard time based on the 24-hour clock unless otherwise noted.

Doppler weather radar data from Fort Smith, Arkansas (located about 63 nautical miles north of the accident site), showed one weak radar echo located northwest of the accident site. The echo was moving northeast about 23 knots, with the maximum radar echo tops at about 8,200 feet msl and the bases about 1,000 feet msl.

At 1153, the surface weather observations for Fort Smith, Arkansas, indicated few clouds at 4,800 feet agl; visibility 10 miles; temperature 66 degrees Fahrenheit; winds from 060 degrees at 7 knots; altimeter setting 30.16 inches mercury. At 1153, the surface weather observations for Texarkana, Arkansas (located about 46 nautical miles south of the accident site), indicated ceiling 4,400 feet agl overcast; visibility 10 miles; temperature 68 degrees Fahrenheit; winds from 230 degrees at 6 knots; altimeter setting 30.16 inches mercury.

Upper air data from North Little Rock, Arkansas (located about 102 nautical miles east-northeast of the accident site), for December 2, 1998, at 1200, showed south to south-southeasterly winds from 10 to 24 knots from the surface to 5,000 feet msl.

At 1125, satellite data showed clouds in the area of the accident site, with cloud movement to the east and cloud tops near 5,200 feet msl.

A witness at the Mena, Arkansas, airport reported visual meteorological conditions were predominant with a ceiling of approximately 2,000 to 2,500 feet agl over the ridges to the south of the airport. As the pilot of an inbound flight from the south approached the airport, he observed the weather to be broken clouds at 3,000 feet to 3,200 feet msl. Airport elevation at Mena is 1,079 feet msl.

Witnesses near the accident site reported the weather at the time of the accident was broken to overcast clouds at about 4,000 feet with rain sprinkles.

The Baron pilot reported that, during her return flight from Mena to Texarkana, the weather en route was 3,000 to 4,000 feet scattered with a visibility of 10 miles.

WRECKAGE AND IMPACT INFORMATION:

The accident site was located west of Umpire, Arkansas, in the foothills of the Quachita Mountain Range (geographic coordinates: 34 degrees 16.124 minutes North latitude and 094 degrees 12.503 minutes West longitude). The initial impact of the airplane occurred on the northern slope of a hill. The impact crater measured approximately 15 feet by 29 feet and approximately 3 feet in depth at its center. Major portions of the upper vertical tail (including the vertical stabilizer cap) and the rudder were located at the initial ground contact point. Portions of the leading edge surfaces exhibited semi-circular indentations consistent with tree diameters. The estimated flight path (descent) of the airplane was approximately 75 degrees

(with respect to the horizon). The aircraft components were located in the crater and in an adjoining debris field measuring approximately 100 feet wide by 500 feet long. The debris field extended on a measured magnetic heading of 360 degrees. One piece of avionics was found in the access road 550 feet from the crater. The nose landing gear was found approximately 735 feet north of the crater.

Green lens material, from the right wing tip position light, was found on the left (west) side of the crater. Components found along the west side of the debris field included the right engine, right wing, and right hand flight controls. Conversely, the left engine, left wing tip, and left hand flight controls were found along the east side of the debris field. Several portions of the vertical stabilizer were found near the southern edge uphill of the crater. According to the manufacturer representative, "damage in the flap track areas indicates that the flaps were in a retracted position".

The doors of the airplane were destroyed; however, portions of the doors and their respective locking mechanisms were found and examined. The locking mechanisms for the main cabin door, the tail cone access door, and the baggage doors were found in the locked position. Numerous aircraft maintenance records were found throughout the debris field.

Internal parts (including numerous fan blades) of each engine were scattered throughout the debris field; however, the majority of the engine components were found north of the crater. Both fan blade hub assemblies were found in the crater. Both engines exhibited rotational scoring and metallic smearing on the inner surfaces of the tubing casing around the majority of its circumference. The fan shafts of both engines were sheared. No impurities, paint chips, or other anomalies were found in the airframe or fuel pump fuel filters. The fuel pump fuel appeared clear and had the odor of jet fuel. The right engine top thrust reverser remained attached to the engine and the lower thrust reverser was found approximately 15 feet from the engine. The left engine thrust reverser (top and lower) remained attached to the engine.

The electrical systems of the airplane were found destroyed. The electrical system was characterized by loose wires, broken connectors, destroyed relays, and separated wire bundles. The majority of the avionics system of the airplane was found destroyed. However, visual examination of the one attitude indicator that was intact (copilot's instrument panel) revealed that the instrument indicated an inverted, nose low position.

All of the airplane was accounted for in the wreckage debris. No complete systems or structures could be examined on site due to the severity of the impact. No evidence of an in-flight fire and/or explosion, in-flight mechanical and/or flight control malfunction was found at the accident site.

MEDICAL AND PATHOLOGICAL INFORMATION:

Postmortem examination of the pilot was performed by Dr. Frank J. Peretti, M. D., Associate Medical Examiner, Arkansas State Crime Laboratory, Little Rock, Arkansas.

Aviation toxicological testing was performed by the FAA Civil Aeromedical Institute (CAMI) at Oklahoma City, Oklahoma. The toxicology was positive for ethanol, acetaldehyde, acetone, isobutanol, isopropanol, and n-propanol in kidney and muscle. See the toxicology report for additional details. According to the NTSB Medical Officer, the findings of numerous other volatiles along with the ethanol indicated that the ethanol was the product of postmortem production.

Medical records obtained from the medical clinic, where the pilot received treatment, and from the CAMI Aeromedical Certification Division were reviewed by the NTSB Medical Officer. The NTSB Medical Officer also interviewed the Baron pilot/nurse and an employee of the accident pilot. The review and interviews disclosed that the pilot was not noted to be on any medications and had no known recent health problems. During the week prior to the accident, the pilot had been his "normal self, and he was not having any business problems." During the flight to Texarkana, the Baron pilot observed nothing to either suggest a medical cause for incapacitation or to rule out incapacitation for medical reasons.

TEST AND RESEARCH:

In February 1999, the airplane was examined, under the surveillance of the NTSB investigator-in-charge, at Air Salvage of Dallas, at Lancaster, Texas. The airplane components and movable control surfaces (ailerons, elevators, rudder, flaps, speed brakes, thrust reversers) were identified and examined. A section of the outside handle of the emergency exit door was identified.

No physical evidence of an in-flight malfunction was found on the primary flight controls (aileron, elevator, rudder), the flaps, or the speed brakes. One thrust reverser actuator on each engine was found attached to its supporting structure in a stowed position (actuator extended). Of the two remaining actuators, one was found with the actuator in the stowed position with the other halfway extended. According to the manufacturer representative, "due to the design of the thrust reverser, the buckets could not deploy if one actuator was in the stowed position."

Sections of the inner and outer turbine shafts for both engines were forwarded to the NTSB Materials Laboratory. Examination of the fracture surfaces on the inner and outer turbine shafts, by the Safety Board's Materials Laboratory staff, confirmed that the shafts for both engines had failed due to torsional overload and bending.

RADAR INFORMATION:

All times are central standard time based on the 24-hour clock unless otherwise noted.

Data was recorded by the Memphis Air Route Traffic Control Center (ARTCC) and the Fort Worth ARTCC Surveillance Radar. Examination of the radar data by NTSB specialists indicated that from 1207:00 to 1210:51, the airplane was proceeding south away from Mena along Federal Airway V289 at an altitude of about 3,500 feet msl. At approximately 1210:51, the airplane turned right to a southwesterly heading and climbed to approximately 5,000 feet msl. About 1212, the airplane entered a descent with a descent rate that reached 8,000 feet per minute.

The radar data did not reveal any evidence of traffic on military instrument route IR164 at the time of the accident. A civilian aircraft (transponder squawk 7306) inbound to Mena, Arkansas, on an IFR flight plan, was cruising on Federal Airway V289 at an altitude higher than N501EZ. An anomalous radar target (transponder squawk 5260) was noted at 1210:27. This radar target only appears once and was located approximately 700 feet horizontally from the Cessna 501 aircraft. No altitude information was noted on the anomalous radar target.

ADDITIONAL INFORMATION:

The Safety Board was notified of the accident about 1300 on December 2, 1998. A partial go-team was dispatched, and the following groups were formed: Witnesses, Operations, Airworthiness (systems, structures, powerplants), and Maintenance Records. Additionally,

Safety Board specialists provided assistance in the areas of Human Performance, Meteorology and Air Traffic Control (Radar data and analysis).

Parties to the investigation were the FAA, Cessna Aircraft Company, and Pratt & Whitney.

The airplane was released to Yates Aviation, Inc.

Pilot Information

Certificate:	Commercial	**Age:**	57, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**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:**	07/07/1997
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	3700 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N501EZ
Model/Series:	501 501	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	5010058
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	11/16/1998, Continuous Airworthiness	**Certified Max Gross Wt.:**	12000 lbs
Time Since Last Inspection:	1 Hours	**Engines:**	2 Turbo Fan
Airframe Total Time:	5874 Hours	**Engine Manufacturer:**	P&W
ELT:		**Engine Model/Series:**	JT15D-1A
Registered Owner:	JIM E. YATES	**Rated Power:**	2200 lbs
Operator:	JIM E. YATES	**Operating Certificate(s) Held:**	None
Operator Does Business As:	YATES AVIATION, INC.	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	TXK, 389 ft msl	**Distance from Accident Site:**	46 Nautical Miles
Observation Time:	1153 CST	**Direction from Accident Site:**	188°
Lowest Cloud Condition:	Unknown / 0 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	Overcast / 4400 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	20°C / 16°C
Precipitation and Obscuration:			
Departure Point:	MENA, AR (M39)	**Type of Flight Plan Filed:**	None
Destination:	TEXARKANA, AR (TXK)	**Type of Clearance:**	
Departure Time:	0000	**Type of Airspace:**	Class G

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	JOYCE	ROACH	**Report Date:**	09/07/2000	
Additional Participating Persons:	LISTED IN	INDIVIDUAL			
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.ntsb.gov/pubdms/.				