# Aviation Investigation Final Report

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| **Location:** | JACKSON, Tennessee | **Accident Number:** | MIA01FA152 |
| **Date & Time:** | June 3, 2001, 16:11 Local | **Registration:** | N31XL |
| **Aircraft:** | Piper PA-31-T2 | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | | **Injuries:** | 5 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Executive/Corporate | | |

## Analysis

About 20 minutes before the accident, the pilot reported to the air traffic controller that he had a problem with an engine and needed to shut the engine down. The flight had just leveled at 23,000 feet. The controller told the pilot that he was near Jackson, Tennessee, and that he could descend to 7,000 feet. About 10 minutes later, the pilot reported he was at 8,000 feet and requested radar vectors for the instrument landing system approach to runway 2 at the McKellar-Sipes Regional Airport, at Jackson. The pilot told the controller he had the left engine shut down. About 5 minutes later, the pilot reported he had a propeller runaway. About 1 minute later, the pilot reported he was in visual conditions and requested radar vectors direct to the airport. About 2 minutes later, the pilot reported he had a cloud layer under him and that he had the localizer frequency for runway 2 set. About 1 minute later, the pilot was told to contact the McKellar Airport control tower. The pilot acknowledged this instruction. No further transmissions were received from the flight. Examination of the left engine at the accident site showed the left propeller control was found disconnected at the point the propeller control extension bracket attaches to the propeller governor. The propeller control cable had also pulled loose from a swaged point at the control rod and was also separated further aft due to overstress. The housing for the propeller control rod was found securely attached to the engine and the control rod was securely attached to the extension bracket. The propeller governor control arm, which was disconnected from the propeller control cable and rod, was found spring loaded into the high RPM position. Examination of the fractured left propeller bracket assembly was performed by the NTSB Materials Laboratory, Washington, D.C. The bracket assembly was fractured in the area of the outermost eyehole, at the point a bolt passes through the bracket assembly and the propeller governor arm. The fracture surface contained small amounts of dirt, grease, and minor corrosion. The fracture surface features include flat areas that lie on multiple planes separated by ratchet marks, features typically left behind by the propagation of a fatigue crack. The fatigue crack emanated from multiple origins on opposite sides of the bracket. The total area of the fatigue crack occupied approximately 85 percent of the fracture surfaces. The fatigue fractures initiated on the outer edges of the

surface and propagated inward toward the center. The remaining 15% of the fracture surface had features consistent with overstress separation. Near the middle of each fatigue region were micro-fussures suggesting that the crack propagated under high-stress conditions. The NTSB Materials Laboratory also examined the separation point between the left propeller control flexible cable and the rigid rod that connects to the bracket assembly. The cable and the swaged part of the rigid rod were in good condition with no fractures or damage. The Piper PA-31-T2 Pilot Operating Handbook, Section 3, Emergency Procedures, does not contain a procedure for loss of propeller control. Section 3 did contain a procedure for "Over speeding Propeller", which stated that if a propellers speed should exceed 1,976 rpm, to place the power lever of the engine with the over speeding propeller to idle, feather the propeller, place the engine condition lever in the stop position, and complete the engine shutdown procedures. Pilot logbook records show the pilot completed a simulator training course for the accident model airplane about 9 days before the accident and had about 13 flight hours in the Piper PA-31-T2.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's shutting down the left engine following loss of control of the left propeller resulting in an in-flight loss of control of the airplane due to the windmilling propeller. Factors in the accident were the failure of the propeller control bracket assembly due to fatigue, the pilot's lack of experience in the type of airplane (turbo propeller) and the absence of a procedure for loss of propeller control in the airplane's flight manual.

### Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE

Findings
1. (F) PROPELLER CONTROL,LINKAGE - FATIGUE
2. PROPELLER CONTROL,LINKAGE - FAILURE,TOTAL
3. PROPELLER CONTROL - LOSS,TOTAL
4. (F) PROCEDURES/DIRECTIVES - INADEQUATE - MANUFACTURER
5. (C) ENGINE SHUTDOWN - PERFORMED - PILOT IN COMMAND
6. (F) LACK OF TOTAL EXPERIENCE IN TYPE OF AIRCRAFT - PILOT IN COMMAND
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Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH

Findings
7. AIRCRAFT CONTROL - NOT POSSIBLE - PILOT IN COMMAND

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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
8. TERRAIN CONDITION - HIGH VEGETATION
9. TERRAIN CONDITION - UPHILL

## Factual Information

HISTORY OF FLIGHT

On June 3, 2001, about 1611 central daylight time, a Piper PA-31-T2, N31XL, registered to Falcon Communications, Inc., crashed near Jackson, Tennessee, while on a 14 CFR Part 91 corporate flight. Visual meteorological conditions prevailed at the time and an instrument flight rules flight plan was filed. The airplane was destroyed and the commercial-rated pilot and four passengers were fatally injured. The flight originated from Malden, Missouri, the same day, about 1525.

Transcript of communications, from the FAA Memphis Air Route Traffic Control Center, show that at 1526:49, the pilot of N31XL reported to the controller that they were off Malden, Missouri, and requesting a instrument flight rules clearance to Fulton County Airport, Atlanta, Georgia. The pilot was given the clearance and told to climb and maintain 23,000 feet. At 1550:52, the pilot reported the flight was level at 23,000 feet. At 1552:15, the pilot of N31XL reported that he had a problem with an engine and needed to shut it down and find somewhere to land. The controller reported to the pilot that the flight was over the McKellar-Sipes Regional Airport, Jackson, Tennessee, and that the flight could descend to 7,000 feet. At 1553:42, the pilot was told that the airport was seven miles behind him. The pilot responded that he was trying to get down and would keep circling. The controller cleared the flight to circle as necessary and to descend to 2,500 feet. At 1601:47, the pilot reported that the flight was descending through 8,000 feet and request that the flight be set up for the instrument landing system approach to runway 2 at McKellar-Sipes. The controller instructed the pilot to maintain 3,500 feet and to fly heading 185 degrees for radar vectors to the final approach course.

At 1602:26, the controller asked the pilot to confirm his previous transmission that he did not need the emergency equipment standing by at the airport. The pilot confirmed he did not need the emergency equipment. At 1603:21, the controller asked the pilot which engine was shutdown. The pilot responded the left engine was shutdown. At 1606:12, the controller instructed the pilot to fly heading 200. The pilot acknowledged. At 1606:51, the controller instructed the pilot to maintain 3,500 feet. The pilot acknowledged. At 1607:12, the controller asked the pilot if he was turning right to 200 degrees. The pilot responded "one xray lima we got a prop runaway here we're gonna have to make a three sixty to come down to two zero zero for xray lima". At 1607:29, the pilot reported the flight was in visual flight rules conditions and requested radar vectors to the airport. The controller instructed the pilot to fly heading 340 degrees to the airport. The controller also stated he could give the flight a lower altitude, but would lose radar contact with the flight. The pilot responded that would be fine and the controller cleared the flight to 2,500 feet.

At 1609:34, the controller reported to the pilot that radar contact was lost, to report the airport

in sight, and to expect a visual approach to runway 2. At 1609:59, the controller asked the pilot his distance from the airport. The pilot responded about 10 miles. The controller asked if the flight was in good visual flight rules conditions. The pilot responded that a cloud deck had just passed under him but that he should be able to intercept the localizer course for runway 2. At 1610:52, the controller instructed the pilot to contact the McKellar-Sipes Airport controller on frequency 127.15. The pilot asked for the frequency again and the controller repeated it. At 1611:04, the pilot responded "twenty seven fifteen one xray lima". No further communications were received from the pilot. (See transcripts of communications).

Recorded radar data from the FAA Memphis Air Route Traffic Control Center showed the flight climbed to and reached 23,000 feet at 1549:18, at a position about 20 nm south of McKellar-Sipes Airport. The flights groundspeed was 212 knots at this time. The flight maintained about 23,000 feet, on a 148 degree heading, and accelerated to a groundspeed of 241 knots. At 1553:02, the flight began a descent, and entered a right turn. The airplane continued in the turning descent with the groundspeed fluctuating between 150 and 200 knots until about 1606, when it had completed a 360 degree turn and was now flying a southerly heading, at 3,500 feet, at a 182 knot groundspeed. At about 1607, the flight began a left turn, descended to 2,600 feet, and decelerated to 119 knots groundspeed. At 1607:50, the flight was lost from radar about 14 nm, on a heading of 160 degrees from the McKellar-Sipes Airport and about 7 nm, on a heading of 145 degrees from the accident site. The flight was flying on a 121 degree heading, at 2,600 feet, at a 119 knot groundspeed. (See radar data).

A witness located about 7 miles southeast of the accident site, in the area that the airplane was last observed on radar, stated that he was inside his house and his attention was drawn to the airplane by the sound of the airplane's engines. One engine was surging. He went outside and observed the airplane to the south of his position. The airplane was flying on a east-southeast heading at an estimated altitude of 2,000-2,500 feet agl. He lost view of the airplane behind trees, but continued to hear the engine surging and it appeared the airplane was making a left turn. The airplane came back into view to the northeast of his position and it had descended to between 1,000 and 1,500 feet agl, and was flying on a west-northwest heading. He lost sight of the airplane to the north-northwest of his position.

Another witness located about 7 miles from the accident site, in the area that radar contact was lost, stated that he, his wife, and his son, observed the airplane from their house, flying toward the northeast at about 1,000 feet agl. The airplane then made a 90-degree heading change toward the northwest, heading in the direction of the McKellar-Sipes Airport. The landing gear was not down and they observed no smoke coming from the airplane. One of the engines RPM was oscillating and the other engine sounded like the propeller was feathered and the engine was running, sounding more like a helicopter. The airplanes nose was pitched up and he thought the pilot was searching for a place to put the airplane down. They lost site of the airplane behind trees.

Witnesses near the accident site observed the airplane flying at an altitude of 150 feet, below a cloud layer. The airplane was flying from the southeast toward the northwest. The airplane

then made a gradual turn to the left and then suddenly turned fast to the left. The engines sounded like they would speed up and then slow down. They lost sight of the airplane behind trees, heading to the west. The engines were not running smooth and he heard engine noise stop, then start, and then stop again. About 10 seconds later, they heard tree branches breaking and then a loud pop sound. They went in the direction they last saw the airplane and located the airplane wreckage. A small fire was burning in the nose and right engine area of the airplane. (See witness statements).

PERSONNEL INFORMATION

The pilot held a FAA commercial pilot certificate with airplane single engine land, airplane multiengine land, and instrument airplane ratings, issued on May 5, 1989. The pilot held a FAA certified flight instructor certificate with airplane single engine land, airplane multiengine land, and instrument airplane ratings, issued on March 17, 2000. The pilot held a FAA first class medical certificate, issued on October 17, 2000, with the limitation that the bearer must wear corrective lenses while exercising the privileges of the certificate. Logbook records show the pilot had accumulated about 9,500 total flight hours, about 9,390 flight hours as pilot-in-command, and 13 flight hours in the Piper PA-31-T2 airplane. The pilot attended the FlightSafety International, Piper Cheyenne I/IA/II/IIXL Pilot Initial Training Course, at Lakeland, Florida, between May 21 and May 25, 2001. During the course the pilot obtained 10 flight hours in a flight simulator for the airplane, and completed a biennial flight review and an instrument proficiency check. (See pilot records).

The pilot-rated passenger seated in the right front seat of the airplane held a FAA private pilot certificate with a airplane single engine land rating, issued on October 2, 2000. The pilot-rated passenger held a FAA third class medical certificate with no limitations, issued on July 1, 1999. FAA records show that at the time the pilot-rated passenger received the private pilot certificate, he reported having 64 total flight hours with 25 flight hours as pilot-in-command. (See supplement E).

AIRCRAFT INFORMATION

The airplane was a Piper Aircraft Corporation model PA-31-T2, registration number N31XL, serial number 31T-8166003, manufactured in August 1981. The airplane was equipped with 2 Pratt and Whitney Canada model PT6A-135, 620 horsepower engines, and 2 Hartzell model HC-B3TN-3B/T10178B-8R propellers.

Logbook records show that on December 3, 1998, at airplane total time 5852.6, the left propeller governor control cable was replaced and rigged. Federal Aviation Administration records show the airplane received damage during a landing gear retracted landing at Lexington, Kentucky, on August 2, 1999. Logbook records show that on September 23, 1999, at airplane total time 5962.4, the left and right engines were removed for a sudden stoppage inspection. On April 18, 2000, the engines and repaired propellers were reinstalled on the airplane, and after some repairs to the airframe, the airplane was ferried from Lexington,

Kentucky, to Washington, Pennsylvania. On July 11, 2000, at airplane total time 5964.6, after additional repairs and accomplishment of an Event No. 1 and No. 2/Annual Inspection, in accordance with the Piper Maintenance Manual, the airplane was returned to service. On April 19, 2001, at airplane total time 6012.1, several system repairs and inspections were performed. On May 3, 2001, the airplane received a pre-purchase inspection with several discrepancies being noted.

Logbook records show the left engine, serial No. PCE-92178, was last overhauled on March 28, 1988, at airplane total time 3595.0. The engine was removed for a sudden stoppage inspection on September 23, 1999, at airplane total time 5962.4 and engine total time 5867.4. The engine was reinstalled after the sudden stoppage inspection on March 31, 2000. The engine was last inspected on July 11, 2000, at airplane total time 5964.6, after accomplishment of an Event No. 1 and No. 2/Annual Inspection, in accordance with the Piper Maintenance Manual.

Logbook records show the right engine, serial number PCE-92206, received a sudden stoppage inspection on March 16, 1998, at airplane total time 5772.5. On September 23, 1999, at airplane total time 5962.4 and engine total time 5867.4, the engine was removed for a sudden stoppage inspection, which resulted in the engine being overhauled on January 3, 2000. On March 31, 2000, the engine was reinstalled on the airplane. On July 11, 2000, at airplane total time 5964.6 and engine total time 5869.6, the engine was inspected in accordance with an Event No. 1 and No. 2/Annual Inspection, in accordance with the Piper Maintenance Manual.

Logbook records show the left propeller was overhauled on November 13, 1999, and reinstalled on the airplane on March 31, 2000. The propeller was last inspected on July 11, 2000, at airplane total time 5964.6, after accomplishment of an Event No. 1 and No. 2/Annual Inspection, in accordance with the Piper Maintenance Manual.

Logbook records show the right propeller was overhauled on October 26, 1999, and reinstalled on the airplane on March 31, 2000. The propeller was last inspected on July 11, 2000, at airplane total time 5964.6, after accomplishment of an Event No. 1 and No. 2/Annual Inspection, in accordance with the Piper Maintenance Manual. (See Airplane Logbook Records).

## WEIGHT AND BALANCE INFORMATION

Calculations show that at the time of the accident the airplane weighed about 8,780 pounds, and the center of gravity was located at 135.3 inches aft of the datum. The maximum takeoff weight for the airplane is 9,474 pounds and the center of gravity limits for 9,000 pounds are 128.8 inches aft of the datum forward limit and 136.0 inches aft of the datum aft limit.

## METEOROLOGICAL INFORMATION

Visual meteorological conditions prevailed at the time of the accident. The McKellar-Spies Regional Airport, Jackson, Tennessee, 1553 surface weather observation was wind 060

degrees at 4 knots, visibility 10 statute miles, light rain, clouds overcast at 2,400 feet agl, temperature 18 degrees C, dew point temperature 17 degrees C, altimeter setting 29.88 inches Hg. The airport is located 7 nm north of the accident site.

WRECKAGE AND IMPACT INFORMATION

The airplane crashed in a wooded area adjacent to Little Johnson Creek, located northeast of Rochelle Road, Jackson, Tennessee. The crash site coordinates were 35 degrees, 29 minutes, 44 seconds North latitude and 88 degrees, 54 minutes, 14 seconds West longitude. The crash site elevation was approximately 560 feet msl. The crash site was located approximately 7 nm south of the McKellar-Sipes Regional Airport.

Examination of the crash site showed the airplane collided with the tops of about 75-foot tall trees on the east side of the creek, while on a 240 degree heading. The airplane then crossed over the creek, collided with additional trees, while in about a 15-degree left bank and 25-degree descent angle, impacting on about 15-degree up sloping terrain. The airplane traveled up the up sloping terrain for about 100 feet, colliding with additional trees, before coming to rest upright. The left outboard wing, outboard left horizontal stabilizer, and the right outboard wing separated along the up sloping terrain. The left inboard wing separated from the fuselage, the right propeller separated from the engine, and the right engine separated from the right wing just prior to the airplane coming to rest. A postcrash fire erupted in the nose and cockpit area of the airplane.

Examination of the crash site showed that all components of the airplane which are necessary for flight were located on or around the main wreckage of the airplane. The landing gear were found retracted and the wing flaps were in the retracted position. Continuity of the flight control system was confirmed. All separation points within the flight control system was consistent with overstress separation. The rudder trim was found set to the 45-degree tab left (nose right) position, which is full nose right trim. The elevator trim was found set to the 18-degree tab down or airplane nose up position. The aileron trim was found set to the 15-degree tab down or right wing down position. Examination of the airframe and engine fuel system showed that each fuel tank contained fuel at the time of the accident. All fuel lines were found unobstructed and the fuel filters for each engine did not contain any contamination.

Examination of the left engine at the accident site showed it was still attached to the left inboard wing, which had separated from the airplane and was lying adjacent to the left rear area of the fuselage. The left propeller was still attached to the engine. The left propeller control was found disconnected at the point the propeller control extension bracket attaches to the propeller governor. The propeller control cable had also pulled loose from a swaged point at the control rod and was also separated further aft due to overstress. The housing for the propeller control rod was found securely attached to the engine and the control rod was securely attached to the extension bracket. The propeller governor control arm, which was disconnected from the propeller control cable and rod, was found spring loaded into the high RPM position. The left engine condition lever was found in the off position at the engine and

the left engine power lever was found in the idle position at the engine. The left power lever in the cockpit was found 1/2 inch above the idle position and the left propeller control in the cockpit was found 1/2 inch above the feathered position. The left condition lever in the cockpit was found in the full forward position. The left engine generator, fuel pressure, and oil pressure warning light bulbs were found with stretched filaments.

Disassembly examination of the left engine assembly and accessories was performed at the manufacturers facilities. The left engine power section displayed rotational signatures and reduction gearbox distress characteristic of the propeller wind milling out of the feathered position, with the gas generator section unpowered and rotating under air loads, for an extensive period of time prior to ground impact. Functional testing of the engine controls, including the propeller governor, revealed no characteristics that would have precluded normal engine operation or the inability to manually feather the propeller prior to ground impact. The engine displayed no indications of any pre-impact anomaly or distress that would have precluded normal engine operation prior to impact. (See Pratt and Whitney Report).

Examination of the right engine at the accident site showed it had separated from the fire wall and that the right propeller had separated from the engine when the propeller flange separated due to overstress during ground impact. The right engine was lying forward of the inboard right wing, which was still attached to the fuselage. The right propeller was found lying just aft of the right wing. The right propeller governor arm was found in a cruise rpm range. The right power lever was found above the idle position in about the 75 percent power range at the engine. The right condition lever was found in the cutoff position at the engine. The right power lever in the cockpit was found in the full forward position. The right propeller control in the cockpit was found in the full forward position in the cockpit. The right condition lever was found 1/2 inch from the full forward position in the cockpit.

Disassembly examination of the right engine assembly and accessories was performed at the manufacturers facilities. The right engine displayed contact signatures to its internal components characteristic of the engine developing significant power at the time of ground impact. The engine displayed no indications of any pre-impact anomaly or distress that would have precluded normal engine operation prior to impact. (See Pratt and Whitney Report).

Examination of the left and right propellers was conducted at the manufacturers facilities. The left propeller was mounted on an assembly stand and air pressure was applied to the pitch change mechanism. The pitch change mechanism was cycled from high to low and low to high pitch several times. It functioned normally. Damage to the left propeller indicated the left propeller was rotating and not in the feathered position at the time of ground impact, and that it had little or no power at the time of ground impact. There were no discrepancies noted that could have precluded normal operation of the left propeller and all damage was consistent with impact damage.

Examination of the right propeller showed impact damage which occurred while the propeller blades were at 9.2 degrees or higher blade angle. Damage to the right propeller indicated it

was rotating with some rotational energy, at low or moderate power, at the time of ground impact. There were no discrepancies noted that could have precluded normal operation of the right propeller and all damage was consistent with impact damage. (See Hartzell Report).

## MEDICAL AND PATHOLOGICAL INFORMATION

Postmortem examination of the pilot was conducted by Cynthia Gardner, M.D., Pathologist, University of Tennessee, Memphis, Tennessee. The cause of death was attributed to multiple injuries. No findings were reported that could be considered causal to the accident. Postmortem toxicology testing of specimens obtained from the pilot was performed by the ToxMed Laboratory, Meharry Medical College, Nashville, Tennessee, and Dr. Dennis V. Canfield, Ph.D., Manager, FAA Toxicology Laboratory, Oklahoma City, Oklahoma. The tests were negative for carbon monoxide, cyanide, ethanol, and drugs. (See Toxicology Report).

Postmortem examination of the pilot-rated passenger, who was seated in the right front seat of the airplane, was performed by Cynthia Gardner, M.D., Pathologist, University of Tennessee, Memphis, Tennessee. The cause of death was attributed to multiple injuries. No findings which could be considered causal to the accident were reported. Postmortem toxicology testing on specimens obtained from the pilot-rated passenger was performed by Dennis V. Canfield, Ph.D., Manager, FAA Toxicology Laboratory, Oklahoma City, Oklahoma. The tests were negative for carbon monoxide and ethanol. The tests were positive for 1.66 ug/ml cyanide in blood, nicotine metabolite in urine, 5.908 ug/ml salicylate in blood, and 171.899 ug/ml salicylate in urine. (See Toxicology Report).

Postmortem examination of the three passengers, who were seated in the passenger cabin of the airplane, was performed by Tony R. Emison, M.D., Madison County Medical Examiner, Jackson, Tennessee. The cause of death for each was attributed to multiple trauma to the head and chest. No findings which could be considered causal to the accident were reported. No toxicology tests were performed on specimens from these three passengers.

## TESTS AND RESEARCH

Examination of the fractured left propeller control extension bracket assembly (bracket assembly) was performed by the NTSB Materials Laboratory, Washington, D.C. The bracket assembly connects the propeller control rod to the propeller governor arm. The bracket assembly was fractured in the area of the outermost eyehole, at the point a bolt passes through the bracket assembly and the propeller governor arm. The fracture surface contained small amounts of dirt, grease, and minor corrosion. The fracture surface features include flat areas that lie on multiple planes separated by ratchet marks, features typically left behind by the propagation of a fatigue crack. The fatigue crack emanated from multiple origins on opposite sides of the bracket. The total area of the fatigue crack occupied approximately 85 percent of the fracture surfaces. The fatigue fractures initiated on the outer edges of the surface and propagated inward toward the center. The remaining 15% of the fracture surface had features consistent with overstress separation. Near the middle of each fatigue region

were micro-fussures suggesting that the crack propagated under high-stress conditions. The average hardness of the bracket was 68.75 HRB. Information supplied to the NTSB by the New Piper Aircraft, Inc., indicated the bracket assembly was manufactured by Piper Aircraft Corporation, using 1025 steel material and the minimum hardness for this material is about 65 HRB. (See NTSB Materials Laboratory Report).

The NTSB Materials Laboratory also examined the separation point between the left propeller control flexible cable and the rigid rod that connects to the bracket assembly. The cable and the swaged part of the rigid rod were in good condition with no fractures or damage. Examination of another Piper PA-31-T2 airplane showed that the housing that the rigid rod passes through on the engine bulkhead is fixed and would hold the rod in place allowing the flexible cable to be pulled by accident forces and separate from the rigid rod at the swaged point. (See NTSB Materials Laboratory Report).

The NTSB Vehicle Recorders Division completed a sound spectrum study on transmissions from the accident airplane recorded by the FAA Memphis Air Traffic Control Center. The purpose of the study was to identify any background sound signatures that could be associated with the aircraft's systems or engines. At 1552:15, when the pilot initially reports that he needs to shutdown an engine, a 1785 and 2380 Hz signal is identified, which could equate to one or both propellers rotating at 1,700 rpm. At 1552:56 and 1553:27, when the pilot acknowledges a radio frequency change and then establishes contact with the next controller, signals consistent with 1,738 and 1,757 rpm are identified. During the last recorded transmission from the pilot at 1611:04, a signal consistent with 1,628 rpm is identified. (See NTSB Sound Spectrum Study).

A fuel sample obtained from the left wing tip fuel tank of N31XL after the accident was analyzed by Panair Laboratories, Inc., Miami, Florida. The sample met all specifications for Jet-A fuel. A fuel sample was also obtained from the fueling facility at the Malden Municipal Airport, Malden, Missouri, the last place N31XL was fueled. The sample was tested by the BP Amoco Oil Company Laboratory, Whiting, Indiana. The sample met all specifications for Jet-A fuel. (See fuel test reports).

The airplane was maintained in accordance with the Piper Aircraft Progressive Inspection program. The complete cycle inspection consists of two 100-hour events, which provides for a complete aircraft inspection in 200 aircraft flying hours. The complete inspection, events one and two must be complied within twelve calendar months. Both the event one and two call for completion of the left and right engine detailed inspection. Item 18 on the left and right engine detailed inspection states "Inspect power lever, start control, propeller governor and propeller reversing linkage for condition, travel, and operation." (See maintenance manual pages).

A representative of Pratt and Whitney Canada stated that unless the propeller is manually feathered, oil pressure from the windmilling gas generator and aerodynamic loads on the propeller will preclude the propeller moving immediately to feather. The windmilling time to feather, or the possibility to reach feather, is dependent upon factors including airspeed and

airframe installation specifics. The windmilling time to feather may only be determined by flight test data for the specific airframe installation. (See record of telephone conversation with Pratt and Whitney Canada representative).

The Piper PA-31-T2 Pilot Operating Handbook, Section 3, Emergency Procedures, does not contain a procedure for loss of propeller control. Section 3 did contain a procedure for "Over speeding Propeller", which stated that if a propellers speed should exceed 1,976 rpm, to place the power lever of the engine with the over speeding propeller to idle, feather the propeller, place the engine condition lever in the stop position, and complete the engine shutdown procedures. The maximum rpm for the propeller is 1,900. (See Pilot Operating Handbook pages).

ADDITIONAL INFORMATION

The wreckage of the airplane was released by NTSB on June 6, 2001, to Paul New, Tennessee Aircraft Services, Inc., Jackson, Tennessee. Components retained by NTSB for further were returned to Tennessee Aircraft Services, Inc. and Falcon Communications, Inc.

## Pilot Information

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| **Certificate:** | Commercial; Flight instructor | **Age:** | 47,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 Valid Medical--w/ waivers/lim | **Last FAA Medical Exam:** | October 17, 2000 |
| **Occupational Pilot:** | Yes | **Last Flight Review or Equivalent:** | May 25, 2001 |
| **Flight Time:** | 9500 hours (Total, all aircraft), 13 hours (Total, this make and model), 9390 hours (Pilot In Command, all aircraft), 50 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

## Information

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| **Certificate:** | Private | **Age:** | 40,Male |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Right |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | None | **Second Pilot Present:** | Yes |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 3 Valid Medical--no waivers/lim. | **Last FAA Medical Exam:** | July 1, 1999 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | October 2, 2000 |
| **Flight Time:** | 40 hours (Total, all aircraft), 0 hours (Total, this make and model) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Piper | **Registration:** | N31XL |
| **Model/Series:** | PA-31-T2 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 31T-8166003 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 8 |
| **Date/Type of Last Inspection:** | July 11, 2000 Annual | **Certified Max Gross Wt.:** | 9474 lbs |
| **Time Since Last Inspection:** | 61.2 Hrs | **Engines:** | 2 Turbo prop |
| **Airframe Total Time:** | 6025.8 Hrs at time of accident | **Engine Manufacturer:** | Pratt & Whitney Canada |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | PT6A-135 |
| **Registered Owner:** | Falcon Communications, Inc. | **Rated Power:** | 620 Horsepower |
| **Operator:** | | **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:** | MKL,434 ft msl | **Distance from Accident Site:** | 7 Nautical Miles |
| **Observation Time:** | 15:53 Local | **Direction from Accident Site:** | 360° |
| **Lowest Cloud Condition:** | | **Visibility** | 10 miles |
| **Lowest Ceiling:** | Overcast / 2400 ft AGL | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 4 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 60° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29.87 inches Hg | **Temperature/Dew Point:** | 18°C / 17°C |
| **Precipitation and Obscuration:** | Light - None - Rain | | |
| **Departure Point:** | MALDEN, MO (MAW ) | **Type of Flight Plan Filed:** | IFR |
| **Destination:** | ATLANTA, GA (FTY ) | **Type of Clearance:** | IFR |
| **Departure Time:** | 15:25 Local | **Type of Airspace:** | Class E |

## Airport Information

| | | | |
|---|---|---|---|
| **Airport:** | McKellar-Sipes Regional KMKL | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 434 ft msl | **Runway Surface Condition:** | Wet |
| **Runway Used:** | 2 | **IFR Approach:** | ILS;Visual |
| **Runway Length/Width:** | 6008 ft / 150 ft | **VFR Approach/Landing:** | |

## Wreckage and Impact Information

| | | | |
|---|---|---|---|
| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | 4 Fatal | **Aircraft Fire:** | On-ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 5 Fatal | **Latitude, Longitude:** | 35.495555,-88.903892 |

## Administrative Information

| | |
|---|---|
| **Investigator In Charge (IIC):** | Kennedy, Jeffrey |
| **Additional Participating Persons:** | Charles O Peters; Federal Aviation Administration; Memphis, TN<br>Paul F Crosby; Pratt and Whitney Canada; Bridgeport, WV<br>Gene Cox; Falcon Communications, Inc.; Malden, MO<br>Thomas McCreary; Hartzell Propeller, Inc.; Piqua, OH<br>Robert Martellotti; The New Piper Aircraft, Inc.; Vero Beach, FL |
| **Original Publish Date:** | October 23, 2002 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=52419 |