# National Transportation Safety Board
# Aviation Accident Final Report

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| **Location:** | AVON PARK, FL | **Accident Number:** | ATL96FA017 |
| **Date & Time:** | 12/05/1995, 0632 EST | **Registration:** | N402RL |
| **Aircraft:** | Cessna 402A | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | | **Injuries:** | 2 Fatal |
| **Flight Conducted Under:** | Part 91: General Aviation - Other Work Use | | |

## Analysis

After takeoff at dawn on a foggy morning, the airplane collided with electrical transmission wires about one mile from the end of the runway, on an extended line about 50 degrees left of the extended runway centerline. The left wing tip fuel tank (left main) was partially severed from the airplane, breaching the tank. Additionally, the top of the vertical stabilizer and rudder were severed, and a portion of the windscreen was separated. A suggestion was made by the operator that the autopilot trim may have been improperly set, precipitating a nose pitch down upon engagement of the autopilot during the climb. The airplane continued to fly for about 20 minutes, then impacted in a steep right wing down attitude into a densely wooded area that was surrounded by open terrain. The ensuing fire precluded any determination of engine malfunction, systems' discrepancies, or wire strike damage to the left propeller. No determination of pilot incapacitation was possible because of the post impact fire. Based upon the ground witness statement, the left engine was probably inoperative following the wire strike. The impact attitude was inconsistent with a decreasing speed loss of control with the left engine inoperative. However, the flight control trim settings, left main fuel tank selected, and throttle quadrant settings all may have been indicative of pilot incapacitation that precluded proper emergency procedure response. Additionally, the airplane impacted into a densely wooded area surrounded by flatter terrain absent of tall obstacles.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot to maintain the proper climb rate and direction of flight following takeoff, resulting in a collision with obstacles. The reason for the loss of control and subsequent unusual attitude ground impact was not determined.

## Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. WEATHER CONDITION - LOW CEILING
2. WEATHER CONDITION - OBSCURATION
3. WEATHER CONDITION - FOG
4. (C) PROPER CLIMB RATE - NOT MAINTAINED - PILOT IN COMMAND
5. OBJECT - WIRE,TRANSMISSION
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Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING

Findings
6. REASON FOR OCCURRENCE UNDETERMINED
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

## Factual Information

History of the Flight

On December 5, 1995, about 0632 eastern standard time, a Cessna 402A, N402RL, collided with an electrical transmission line, during the initial climb after take off at Avon Park, Florida. The airplane was operated by Missionary Aviation Ministries under the provisions of Title 14 CFR Part 91, and visual flight rules. Instrument meteorological conditions prevailed. An instrument flight plan was filed the previous evening, but was not activated after take off. The airline transport pilot, and the pilot rated passenger, were fatally injured. The airplane was destroyed by impact forces, and a post impact fire. The flight was originating from runway 22 at the Avon Park Municipal Airport, at the time of the accident.

At 2118, December 4, 1995, a person who identified himself as N402RL, contacted the Miami Automated International Flight Service Station via telephone and requested a flight briefing from Avon Park, Florida to Port-au-Prince, Haiti, proposing to depart Avon Park at 0630 on December 5, 1995. Following the weather briefing, the person filed an instrument flight rules flight plan to Moss Town, Exuma Island, Bahamas. [Transcript attached].

According to the operator, the flight was destined for Haiti to deliver food, clothing, and medicine, with a planned intervening stop in the Bahamas for fuel. Witnesses that were located about 1/2 mile from the end of runway 22, reported hearing an explosion. The forward, upper portion of a wing tip tank, later identified as the left tip tank, an antenna, a rudder cap, and the vertical stabilizer cap were found beneath separated power lines. According to the local electrical power company, electrical power was interrupted at the site of the separated power lines at 0632, December 5, 1995.

Citizens reported seeing a low flying airplane about 0645 on December 5, to the Highlands County Sheriff's Office, who was responsible for the local search of the airplane. The reports were of a twin engine airplane flying at low altitude, with one engine operating at a very high speed. One of the citizen reports came from an emergency medical technician (EMT) who was also a pilot, familiar with twin engine Cessna airplanes. The reported sightings were in the Lake Placid, Florida area, with the last sighting made by the EMT, who indicated that the airplane was headed north. Lake Placid is located about 20 nautical miles south of Avon Park. The wreckage was discovered about six miles north of the last reported sighting.

The wreckage of the airplane was found the next day about 4.5 miles southwest of Sebring Air Terminal, which is about 14 miles southeast of Avon Park Municipal Airport. The burned wreckage was scattered about 60 feet, through dense woods.

Personnel Information

A logbook for the pilot was not located. According to Federal Aviation Administration Airman Certification Records, the pilot held an airline transport pilot (ATP) certificate with an airplane multiengine rating. He held commercial pilot privileges for airplane single engine land, and private privileges for glider. His initial ATP certificate was issued July 12, 1977. The initial multiengine land rating was issued following a flight check in a Piper PA-30 on November 21, 1974.

On April 23, 1993, the pilot added a multiengine rating to his previously issued flight instructor's certificate. On April 19, 1993, he received a notice of disapproval of application for

the flight instructor airplane multiengine rating. The notice of disapproval indicated that upon reapplication he would be reexamined on multiengine operations, takeoffs & climbs, stalls, performance maneuvers, emergencies, and approach and landings.

The pilot was issued a second class medical certificate on September 28, 1995, with the limitation that the holder shall possess correcting glasses for near vision while exercising the privileges of his airman certificate. The application listed his occupation as retired.

According to an affidavit obtained from the insurance adjuster, the pilot received a Biennial Flight Review on November 7, 1994, in a Piper PA-28-161 Warrior. A signed statement provided by the operator of 402RL indicated that the pilot successfully completed an instrument competency check on October 18, 1995, in a single engine Cessna airplane. Another statement indicated that the pilot received night currency flight with a flight instructor, in a Cessna 172, also on October 18, 1995.

During the review of the FAA's airman certification file regarding the pilot, it was noted that on his application for the airplane multiengine additional instructor rating on April 23, 1993, he had listed 2,439 pilot in command flight hours. On his additional aircraft rating application for a multiengine rating dated November 21, 1974, the pilot listed 1,762 pilot in command flight hours. The pilot's application for his medical certificate dated September 28, 1995, indicated that his total flight hours were 2,700, with zero hours within the previous six months.

The operator, who is a certificated flight instructor, stated that he provided the pilot with a two hour familiarization flight in N402RL on December 12, 1994. Between December 12, 1994, and January 13, 1995, the operator stated that he provided 52 hours of additional instruction in the airplane, during flights to and from Haiti. No information regarding the pilot's flight hours between January 13, 1995, and October 31, 1995, was available. On October 31, 1995, according to the operator, he provided a route check and airplane systems check to the pilot, during a ten hour flight to Haiti and the return to Avon Park. The operator stated that in November, 1995, the pilot flew N402RL between Avon Park and Haiti on the 7th, 16th, 21st, and the 30th. Each trip involved about ten flight hours.

According to the operator, the pilot rated passenger was allowed to accompany the flight to obtain experience with multiengine airplanes. According to FAA records he possessed a private pilot certificate with airplane single engine land and instrument ratings. He received a third class medical certificate on February 17, 1994, with no limitations.

Additional personnel information is contained in this report on page 3 under the heading First Pilot Information, and Supplement E.

Aircraft Information

According to the operator, the aircraft logs and records were on the airplane at the time of the accident. He reported that the last annual inspection of the airplane was accomplished by Engles Air Service, Inc. in Lake Wales, Florida.

During a telephone interview, the owner of Engles Air Services, Inc. stated that N402RL had an annual inspection on June 30, 1995. At that time, the airplane's total hours were approximately 11,500. He did not recall the engine hours, and did not have any work orders, because the inspection had been completed at no cost to Missionary Aviation Ministries. His check of the airworthiness directives applicable to the airplane indicated that the wing spar

required an inspection, which was conducted by QC Laboratories, Inc. The work order for the inspection indicated that an eddy current inspection of the lower spar cap fittings was performed with no discrepancies noted.

The operator reported that, at takeoff, the airplane had 140 gallons (about 840 pounds) of 100/130 octane aviation gasoline and had been loaded with approximately 1200 pounds of cargo in boxes. According to the operator, the boxes were filled, then weighed. No record of the weight manifest was retained. He also reported that the occupants weighed about 200 pounds, each. FAA records recorded the occupants weights as 243 pounds for the pilot and 175 pounds for the pilot rated passenger. The airplane's weight and balance form was not located. The cargo was destroyed by fire, and could not be weighed. The gross weight and empty weight of the airplane was listed in a like make and model Owner's Manual as 6,300 pounds and 3,719 pounds, respectively. After allowing for engine oil of 49 pounds, the airplane useful load was approximately 2,532 pounds. Additional information is located in this report on page 2 under the heading Aircraft Information.

Meteorological Information

The weather observation at Vero Beach, Florida , located abut 65 Nmi east of Avon Park, at 0555 on December 5, 1995, was as follows: sky partial obscuration; visibility 1/2 mile in fog; temperature/dew point 56/56 degrees F.; wind 300 degrees at four knots; and altimeter setting 30.05" Hg.

At 0635, December 5, 1995, a surface special observation at Vero Beach, Florida, was as follows: sky 8,000 feet scattered; visibility one mile in fog; wind 310 degrees at five knots; and altimeter setting 30.07" Hg.

A special surface observation was made at 0620 at Lakeland, Florida, about 35 Nmi northwest of Avon Park which was as follows: sky 400 feet scattered; visibility three miles in fog; temperature/ dew point 53 degrees F.: wind calm; and altimeter setting 30.01" Hg.

The weather observation at Bartow, Florida, about 25 Nmi north of Avon Park at 0748 was as follows: sky obscured; visibility one mile in fog; temperature/dew point 59/58 degrees F.; wind calm; and altimeter setting 30.12" Hg.

Additional weather information is contained on page 4 of this report under the heading Weather Information.

Wreckage and Impact Information

The terrain beyond the departure threshold of runway 22, which was used for the takeoff, consisted of flat marshland and sectioned off mobile home lots. Most of the lots were vacant. About one mile from the departure end of the runway, a power line crossed the runway's extended centerline. The lower two wires of a set of three were separated. Debris that was later identified as having come from N402RL, was found on the ground about 200 yards south of the power lines. The debris consisted of sections of wound cable consistent with the separated power lines, the left wing tip navigation light red lens, pieces of Plexiglas, the forward, top 1/3 of the left wing tip fuel tank, the top of the vertical stabilizer, and the top of the rudder that included the anti-collision light. Impact marks on the top portion of the left fuel tank were consistent with a wound cable. A straight line drawn between the left wing tip and the top of the vertical stabilizer, indicated that the airplane would have been in a right bank of about 20 degrees, in a nose level attitude, to contact both points on the airplane with a

horizontal cable that was parallel to the ground.

The remainder of the wreckage was located approximately 27 degrees 23 minutes North and 81 degrees 22 minutes West, between US Highway 27 and Lake Istokpoga. The terrain was flat, except for the wreckage site which was thickly wooded.

The wreckage debris was scattered along an azimuth of about 104 degrees. Broken trees were found on the west side of the debris trail that were broken off about 40 feet and 20 feet above the terrain from west to east, respectively (See wreckage diagram). A crater was found in the ground that was about two feet deep and was located about 68 feet east of the first tree broken off at 40 feet above the ground. The angle between the crater and the broken off tree was calculated as 30 degrees. The right wing tip tank was found immediately west of the ground crater. A burned area began immediately east of the crater and extended eastward about 55 feet. The preponderance of the airplane debris was contained within the burned area. The debris extended from west to east in the following order; right wing tip tank, right engine, empennage, fuselage, wings, cockpit area, and left wing tip tank.

The airplane and its cargo were destroyed by the fire. Distinct impact damage to the fuselage and the wings could not be discerned. The vertical stabilizer and the rudder were located with the top portion absent, which was consistent with the portion found beneath the earlier described power lines. It was noted that the upper rudder hinge was still in place. The remainder of the left wing tip fuel tank was located at the eastern extremity of the debris trail.

In addition to the right wing tip fuel tank located at the beginning of the debris trail, the right engine and attached propeller was located at the west end of the debris trail, also. The engine was standing on its aft end and exhibited burn damage. One propeller blade exhibited "S" curve damage. The following propeller blade, when viewed during rotation, was bent rearward with the tip four inches, approximately, twisted toward low pitch. The third propeller blade was bent in a broad arc rearward, and exhibited chordwise scratches on the blade back, and spanwise scratches on the blade back that extended from the blade midpoint outboard to the tip.

The left propeller was separated from the engine and was extensively damaged by fire. Its mounting studs remained in the engine crankshaft flange. The stub of one propeller blade exhibited extensive melting. The following blade was bent aft in a broad arc, with 3/4 of the deice blanket portion of the blade burned away. This blade also exhibited chordwise scratches at the tip stub. About four inches of the tip were also burned away. The third blade was broken in the hub with the leading edge in a position that approximated the feather position. Additionally, this blade had the outboard four inches, approximately, burned away.

No instruments were found that were readable. The throttle quadrant was located. The throttle levers were fully aft with the propeller and mixture controls in a mid position. There was continuity of the flight controls except for the left aileron cable which exhibited typical tensile overload failure at the separated ends. The fuel selector handles and valves were found on the left and right main fuel tank, the wing tip tanks, respectively. Because of the breached left main fuel tank, and the flight path of the airplane, the fuel on board at the time of the accident was estimated to be 72 gallons. The landing light in each wing tip tank was extended.

Medical and Pathological Information

A postmortem examination of both occupants was conducted by Alexander Melamud, M.D., of the Medical Examiner's Office District Ten 1290 Golfview Avenue Bartow, Florida

33830. The same office also conducted toxicological examinations of both occupants. The toxicological examination of the pilot was negative for ethanol and other drugs. The report of the examination of the passenger stated "Postmortem blood alcohol level is 0.019 g/dl."

Toxicological examinations of both occupants were conducted by the FAA Toxicology and Accident Research Laboratory. Carbon monoxide and cyanide analysis was not done for the pilot because of a lack of a suitable specimen. The examination of the pilot was negative for ethanol and other drugs. The examination of the passenger was negative for ethanol, with a detection cutoff of 10 mg/dl.

Tests and Research

Both engines were removed to the manufacturer's facility in Mobile, Alabama, for tear down and examination. A report of the examination is attached.

Additional Information

During discussions with the operator about the accident, he stated that when he last observed the airplane following takeoff, it was in a normal climb attitude with the landing gear retracted. At that time he reported that he walked behind a hangar to his car and left the airport. Later, he was notified that pieces of the airplane had been found near the power lines. During the discussions, he opined that if the autopilot trim had been set nose down, and the autopilot engaged following takeoff, the airplane may have pitched down from its normal climb attitude. None of the autopilot components were salvaged from the burned wreckage.

The wreckage was released to the operator, Missionary Aviation Ministries.

## Pilot Information

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| **Certificate:** | Airline Transport; Flight Instructor | **Age:** | 57, Male |
| **Airplane Rating(s):** | Multi-engine Land; Single-engine Land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | Glider | **Restraint Used:** | Seatbelt |
| **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 2 Valid Medical--w/ waivers/lim. | **Last FAA Medical Exam:** | 09/28/1995 |
| **Occupational Pilot:** | | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 2700 hours (Total, all aircraft), 104 hours (Total, this make and model) | | |

## Aircraft and Owner/Operator Information

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|---|---|---|---|
| **Aircraft Make:** | Cessna | **Registration:** | N402RL |
| **Model/Series:** | 402A 402A | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | No |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 402A-0051 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 2 |
| **Date/Type of Last Inspection:** | 06/30/1995, Annual | **Certified Max Gross Wt.:** | 6300 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 2 Reciprocating |
| **Airframe Total Time:** | 11512 Hours | **Engine Manufacturer:** | Continental |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | TSIO-520 |
| **Registered Owner:** | MISSIONARY AIVATION MINISTRIES | **Rated Power:** | 300 hp |
| **Operator:** | MISSIONARY AIVATION MINISTRIES | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Instrument Conditions | **Condition of Light:** | Dawn |
| **Observation Facility, Elevation:** | GIF, 146 ft msl | **Distance from Accident Site:** | 30 Nautical Miles |
| **Observation Time:** | 0653 EST | **Direction from Accident Site:** | 330° |
| **Lowest Cloud Condition:** | Unknown / 0 ft agl | **Visibility** | 0.25 Miles |
| **Lowest Ceiling:** | Obscured / 100 ft agl | **Visibility (RVR):** | 0 ft |
| **Wind Speed/Gusts:** | 4 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 350° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30 inches Hg | **Temperature/Dew Point:** | 14°C / 14°C |
| **Precipitation and Obscuration:** | | | |
| **Departure Point:** | (AVO) | **Type of Flight Plan Filed:** | IFR |
| **Destination:** | EXEUMA, AO (MYEF) | **Type of Clearance:** | None |
| **Departure Time:** | 0630 EST | **Type of Airspace:** | Class G |

## Airport Information

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| **Airport:** | AVON PARK MUNICIPAL (AVO) | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 155 ft | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 22 | **IFR Approach:** | None |
| **Runway Length/Width:** | 4000 ft / 75 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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

## Administrative Information

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| **Investigator In Charge (IIC):** | PRESTON E HICKS | **Report Date:** | 09/19/1996 |
| **Additional Participating Persons:** | RICHARD K SHEPPARD | | |
| **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/. | | |