Aviation Investigation Final Report

Location:	Armonk, New York	**Accident Number:**	NYC02FA044
Date & Time:	December 31, 2001, 16:16 Local	**Registration:**	N2173W
Aircraft:	Raytheon BE-23-B24R	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane departed on an IFR flight in VFR conditions. The takeoff, climbout, and initial cruise were normal. Approximately 35 minutes into the flight, ATC advised the pilot he was off course. The pilot responded he was trying to rejoin the airway. The controller instructed him to fly a heading, and when able, to proceed direct to the next VOR on his route. The controller also advised the pilot of a possible mode "C" problem. Radio contact was then lost for about 20 minutes. When contact was reestablished, the pilot reported having electrical problems, and that his radios were intermittent. The pilot added that he was climbing to 8,500 feet, and continuing to his destination, which was approximately 180 miles away. That was the last recorded transmission from the accident airplane. About 30 minutes later and approximately 110 miles short of his planned destination, the pilot started maneuvering to land at a local airport. The pilot of another airplane witnessed the airplane in a steep bank, just before the accident. The airplane impacted in a parking lot, and was partially consumed in a post crash fire. Examination of the wreckage revealed the airplane was configured for approach, and the landing gear was down. No preimpact failures were identified with the wreckage. Maintenance records showed that the airplane had failed an IFR certification inspection about 2 months before the accident, and that the wiring behind the instrument panel was "extremely bad." Examination of the alternator revealed that the brushes were worn asymmetrically consistent with a partial short in the rotor, or a rough slip ring. From the time the pilot first lost radio contact until the accident, the airplane passed within 25 nautical miles of approximately 20 public airports.

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 aircraft control.

Findings

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

Findings
1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

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

Findings
2. TERRAIN CONDITION - OTHER

Factual Information

HISTORY OF FLIGHT

On December 31, 2001, at 1616 eastern standard time, a Raytheon BE-23-B24R (Sierra), N2173W, was destroyed when it impacted terrain near Armonk, New York, while maneuvering to land at the Westchester County Airport (HPN), White Plains, New York. The certificated commercial pilot was fatally injured. Visual meteorological conditions prevailed for the cross-country flight that originated from Pease International Tradeport (PSM), Portsmouth, New Hampshire, destined for Northeast Philadelphia Airport (PNE), Philadelphia, Pennsylvania. An instrument flight rules flight plan was filed and activated for the personal flight conducted under 14 CFR Part 91

According to communication tapes, shortly after takeoff, the pilot contacted Manchester Departure Control, and was cleared to 8,000 feet. The controller advised the pilot to fly a heading of 240 degrees until passing 3,000 feet, and then to proceed direct to the Manchester VOR (MHT). Afterwards, he was to fly his "flight plan route," which was, V104 Gardner (GDM), V14 Norwich (ORW), V16 to join V276, Yardley (ARD), and then direct North Philadelphia. The controller advised the pilot that the last two numbers of his assigned transponder code were incorrect, and that he should be squawking 1467, which the pilot acknowledge.

The controller then asked the pilot what code was set in his transponder. The pilot responded 1467, and the controller advised him she was seeing 1477. The controller instructed the pilot to recycle the third number. The pilot recycled the number, and the controller advised him she was still seeing 1477, adding she would just change his assigned squawk to 1477. The controller then instructed the pilot to change frequency.

The pilot checked in on the new frequency, and advised the controller he was climbing to 8,000 feet. The controller instructed him to maintain 6,000 feet for overtaking traffic, which the pilot acknowledged. A few minutes later, the controller asked how his "ride" was at 6,000 feet. The pilot responded that he was experiencing some turbulence, and would prefer 8,000 feet. The controller cleared the pilot to 7,000 feet, and told him to expect 8,000 feet in 5 minutes.

A couple of minutes later the pilot was cleared to his requested altitude. He was then instructed to contact Boston Center. He contacted Boston, and after approximately 15 minutes was instructed to contact Bradley Approach Control. The pilot acknowledged the transmission, and contacted Bradley.

About 10 minutes later, the Bradley controller advised the pilot he was off course. The pilot responded by saying he was trying to rejoin the airway. The controller then instructed him to fly a heading of 180 degrees, and when able, to proceed direct to the ORW VOR. A few minutes

later, the controller asked the pilot what altitude he was maintaining, adding, he was seeing some altitude deviations, and that it might be the transponder's Mode "C." The pilot responded 8,000 feet. Several minutes later, the controller tried to contact the pilot, but did not receive a reply. The controller then made several more attempts, all unsuccessful.

About 20 minutes after losing radio contact, the controller was able to reestablish communications. The pilot advised the controller he was having electrical problems, and his radios were intermittent. He added, he was climbing to 8,500 feet, and proceeding direct to the Carmel (CMK) VOR and then to North Philadelphia to avoid New York's "TCA." That was the last recorded transmission from the accident airplane. Air Traffic Control continued to monitor the airplane as the flight progressed, occasionally receiving an altitude readout from the airplane's transponder.

Approximately 30 minutes later when the airplane was in the Westchester area, a controller for New York Approach asked the pilot of another airplane if he had the accident airplane in sight. The observing pilot reported the airplane in sight, and the controller replied "it looks like he is going to runway 34, can you follow him from that position," which the pilot said he could. The controller then radioed he was showing a Mode "C" of 800 feet for the accident airplane. The observing pilot responded, "that looks about right." The controller added that he had lost radar contact, and that the airplane looked like it was in a steep descent before contact was lost.

The observing pilot reported that he lost sight of the airplane. The approach controller was then advised by the Westchester local controller that the airplane had crashed. A couple of minutes later, the observing pilot advised the approach controller that when he lost sight of the airplane it was in a "steep bank."

Radar returns for the accident airplane were intermittent in the Westchester area, and only six returns could be associated with the airplane. All were within 1/4 mile of the accident site and covered a time span of approximately 23 seconds. The altitude for the returns started at 900 feet msl and ended at 500 feet msl.

The accident occurred during the hours of daylight. The wreckage was approximately 3.7 miles to the north of Westchester Airport at 41 degrees, 06.812 minutes north latitude, 73 degrees, 43.082 minutes west longitude, and an elevation of 540 feet msl.

AIRCRAFT INFORMATION

According to Federal Aviation Administration (FAA) records, the airplane was manufactured in 1974, and was leased by the pilot. It was equipped with a 200-horsepower Lycoming IO-360 engine, and a constant speed propeller.

Examination of the maintenance logbooks revealed that an annual inspection was performed on March 16, 2001, at a facility in Beverly, Massachusetts. According to an invoice, the airplane received an IFR certification inspection on November 12, 2001, by a facility in

Portsmouth, New Hampshire, which the airplane did not pass. In addition, several discrepancies were noted on the invoice. The floor panel below the pilot station was broken, and no action was taken. The static system had a "bad" leak. Some repairs were made, but the system still leaked. The transponder did not meet specifications. It was "green tagged," and not reinstalled. There was no recorded of a transponder being installed prior to the accident. "Extremely bad" wiring was identified behind the instrument panel, and no action was taken. The left side of the instrument panel had evidence of water, "possibly from windshield," and no corrective action was listed.

According to another invoice dated November 14, 2001, the alternator, along with some other items, were repaired at a facility in Biddeford, Maine. According to a representative for the facility, the connector for the wire that attaches to the field terminal on the alternator had broken. The connection was repaired, and the system operated normally.

A pilot who worked for the accident pilot, and who flew the airplane to Biddeford on November 12, 2001, reported that during the flight he lost all electrical power, except for the battery. To conserve power, so he would not have to manually extend the landing gear, he shutdown all the radios and the electrical master. The pilot added that on two other occasions, another pilot reported that the cockpit lights started to pulsate during a night flight. The pilot was not aware of anyone experiencing any electrical problems with the airplane after the alternator was repaired in Biddeford.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with ratings for airplane single-engine-land, multi-engine-land, and instrument airplane. On the pilot's last FAA second-class medical certificate, which was dated November 19, 2001, he reported a total flight experience of 1,300 hours. The owner of the airplane who the pilot had leased the airplane from estimated the pilot had a total flight experience of 1,400 hours, with 10 hours of that being in the accident airplane. The pilot's logbook was not identified at the accident site, and additional attempts to locate it were unsuccessful.

METEOROLOGICAL INFORMATION

A weather observation taken at Westchester 26 minutes after the accident recorded the wind as 310 degrees at 7 knots, visibility 10 miles, few clouds at 25,000 feet, temperature 28 degrees Fahrenheit, dew point 7 degrees Fahrenheit, and an altimeter setting of 29.96 Hg.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted in a parking lot. The debris path was approximately 90 feet long and oriented on a magnetic heading of 018 degrees. The start of the debris path was marked by scrapes and paint transfer on the surface of the asphalt. About 8 feet past the start of the debris path was an oil stain. The stain was shaped like a fan, approximately 10 feet long, and

oriented on the longitudinal axis of the debris path. Approximately 3 feet past the beginning of the oil stain were several gouges in the surface of the parking lot. The gouges were approximately 3 inches long, less than 1/2 inch deep, and orientated approximately on the lateral axis of the debris path. The airplane came to rest on a magnetic heading of 330 degrees in some shrubs that separated the parking lot from a walkway. One vehicle in the parking lot sustained minor damage. A post crash fire consumed the cockpit and cabin area of the airplane. In addition, both wings displayed impact and fire damage.

Examination of the airframe revealed that the landing gear was in the down position, and the flaps were approximately 10 degrees. Flight control continuity was confirmed from the control surfaces to the pilot control column. Elevator trim was approximately 7 degrees nose up. The fuel selector was set to the "LEFT" tank. The selector had three positions, "LEFT," "RIGHT," and "OFF." Continuity of the fuel and electrical system could not be verified because of impact and fire damage. All of the wreckage was recovered January 1, 2002, and transported to a storage facility in Clayton, Delaware, for further examination.

TEST AND RESEARCH

On January 3, 2002, the engine and propeller were examined at a facility provided by the recovery company. No "S" bends, or chordwise scratches were observed on either propeller blade. The No. 1 blade had a scrape mark on its tip, and a series of scratches on its front. The scratches averaged approximately 3 inches in length and were orientated approximately 45 degrees to the longitudinal axis of the blade. The No. 2 blade had two gouges on its leading edge. The largest of the gouges was approximately 0.12 inch deep and 0.14 inch wide. The second gouge was approximately 0.06 inch deep and 0.08 inch wide. In addition, the leading edge of the blade displayed a series of scrape marks. The marks started approximately 8 inches from the propeller hub and continued to the tip of the blade.

The vacuum pump was removed and the shear coupling was found to be melted, but intact. The sparkplugs were removed. The top sparkplugs were absent of debris and grayish in color. The bottom sparkplugs for the No. 1, No. 2, and No. 3 cylinders were all coated in oil. The bottom sparkplug for the No. 4 cylinder was grayish and absent of debris. A rotational force was then applied to the engine crankshaft. Initially, resistance was felt, and the sound of plastic cracking was heard coming from the magnetos. Examination of the magnetos revealed impact and fire damage. The magnetos were removed, and a second attempt was made to rotate the crankshaft. The crankshaft rotated, and thumb compression was obtained on the No. 1, No. 3, and No. 4 cylinders. The No. 2 piston articulated, but compression was not obtained.

Valve train continuity was confirmed for the No. 1, No. 3, and No. 4 cylinders. Valve train continuity could not be confirmed for the No. 2 cylinder. Examination of the No. 2 cylinder revealed impact damage to the valve assembly, and to some of the cooling fins. The exhaust valve was closed, and the intake was stuck in the open position. The No. 2 cylinder push rods displayed impact and fire damage, and had separated from the cylinder. A borescope

examination of each cylinder revealed that all the pistons and valves were grayish in color and absent of any mechanical impact marks.

During engine crankshaft rotation, both magneto drive gears turned, the engine driven fuel pump piston actuated, and the vacuum pump drive pad rotated. The propeller governor was removed from the accessory gear section. A counter clockwise rotational force was applied to the input drive. The drive rotated freely, and oil was expelled from the inflow port. A clockwise rotational force was then applied. Once again, the drive rotated freely, but no oil was observed coming from the outflow port. The pump was then held upside down, and couple of drops of oil fell from the inflow port. The engine oil suction screen was removed. The screen was absent of debris except for an object approximately 1 inch long and 0.02 inch thick. The object was organic, and similar to thorns on the shrubs where the airplane came to rest. The engine-oil-pressure screen was removed, and absent of debris.

The engine driven fuel pump was disassembled. The pump was intact mechanically, but all the rubber components in the pump displayed fire damage. The fuel-servo fuel screen was removed and found absent of debris or contamination. The fuel servo was separated from the engine. The throttle arm was approximately full open, and the mixture arm was approximately full rich. The throttle plate was intact and in the full open position. All four fuel nozzles were removed. Nozzles No. 2, No. 3, and No. 4 were unobstructed. The No. 1 nozzle was obstructed about 35 percent with a sooty material.

Examination of the engine starter revealed a static impact mark on the nose housing. The mark was similar in size and shape to an impact mark on the starter ring gear. Examination of the alternator revealed that all six diodes displayed fire damage. The brush tensioning assembly was destroyed in the post crash fire, but the brushes were intact. They were removed from the alternator. One of the brushes measured 0.39 inch on the wear axis. The wear pattern on the other brush was asymmetrical, with one side of the wear axis measuring 0.18 inch and the other measuring 0.21 inch. The alternator rotor and stator displayed rotational scoring.

On April 1, 2002, the alternator was examined under the supervision of an FAA inspector at an alternator manufacturing facility. According to the specialist that performed the examination, none of the electrical components could be tested because of fire damage. The data plate was partially destroyed, and the specialist was not able to determine who had overhauled the unit last. Because of fire damage, he was not sure, but believed the unit was an FAA approved part. The specialist added that the asymmetrical wear on the brushes could have been produced by either a partial short in the rotor, or a rough slip ring. Neither one of these scenarios could be confirmed because of fire damage.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at the Medical Examiner's Office in Valhalla, New York, on January 1, 2002. The FAA Toxicology and Accident Research Laboratory in Oklahoma City,

Oklahoma, performed a toxicological test on the pilot on February 6, 2002.

ADDITIONAL INFORMATION

According to a New York Sectional Aeronautic Chart, from the time the pilot first lost radio contact until the accident, he passed within 25 nautical miles of approximately 20 public airports.

The airplane, minus the alternator, was released to the owner's representative on January 4, 2002. The alternator was then released to the owner's representative on April 15, 2002.

Pilot Information

Certificate:	Commercial	**Age:**	49,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:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	November 19, 2001
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1400 hours (Total, all aircraft), 10 hours (Total, this make and model), 20 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Raytheon	**Registration:**	N2173W
Model/Series:	BE-23-B24R	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	MC-265
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	March 16, 2001 100 hour	**Certified Max Gross Wt.:**	2750 lbs
Time Since Last Inspection:	100 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3877 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-360-A1B6
Registered Owner:	Mahmoud Kanj-Elassafiri	**Rated Power:**	200 Horsepower
Operator:	Clarence J. James	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HPN,439 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	16:32 Local	**Direction from Accident Site:**	176°
Lowest Cloud Condition:	Few / 25000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	-2°C / -14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Portsmouth, NH (PSM)	**Type of Flight Plan Filed:**	IFR
Destination:	Philadelphia, PA (PNE)	**Type of Clearance:**	IFR;VFRT
Departure Time:		**Type of Airspace:**	Class D

Airport Information

Airport:	Westchester County HPN	**Runway Surface Type:**	Asphalt
Airport Elevation:	439 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	16	**IFR Approach:**	None
Runway Length/Width:	6548 ft / 150 ft	**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	41.113609,-73.718055

Administrative Information

Investigator In Charge (IIC):	Muzio, David
Additional Participating Persons:	Robert Cabrera; FAA/FSDO; Farmingdale, NY David Moore; Lycoming; Ardsley, PA Robert Ramey; Raytheon; Wichita, KS
Original Publish Date:	June 4, 2002
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=53970