



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	BROCKWAY, MT	<b>Accident Number:</b>	SEA95FA025
<b>Date &amp; Time:</b>	11/29/1994, 1950 MST	<b>Registration:</b>	N22CN
<b>Aircraft:</b>	PIPER PA-31T1	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Business		

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## Analysis

The airplane was level at FL220 at night when vertical fluctuations in altitude up to 500 feet above altitude were noted by the Salt Lake Center controller. Immediately thereafter, the aircraft began a descent and transponder targets were lost. A trajectory study showed the aircraft descending in a tight right turn. Examination of the wreckage revealed that the right elevator separated in negative overload with both wings separating negatively. Wreckage distribution established separation of the empennage and its associated control surfaces before the separation of the wings. A preimpact fire was witnessed and the main fuselage was destroyed by an intense postcrash fire. The initiating event which resulted in the altitude divergence and descending turn could not be determined.

## Probable Cause and Findings

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

## Findings

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

### Findings

1. (C) REASON FOR OCCURRENCE UNDETERMINED  
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Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION  
Phase of Operation: DESCENT - UNCONTROLLED

### Findings

2. LIGHT CONDITION - DARK NIGHT  
3. FLIGHT CONTROL,ELEVATOR - OVERLOAD  
4. FLIGHT CONTROL,ELEVATOR - SEPARATION  
5. WING - OVERLOAD  
6. WING - SEPARATION  
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Occurrence #3: FIRE  
Phase of Operation: DESCENT - UNCONTROLLED  
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Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER  
Phase of Operation: DESCENT - UNCONTROLLED

## Factual Information

### HISTORY OF FLIGHT

On November 29, 1994, at 1950 mountain standard time, a Piper PA-31T1 Cheyenne, N22CN, being flown by a multi-engine, instrument rated, private pilot, broke up in flight and then collided with terrain during an uncontrolled descent. The aircraft was destroyed and a pre/post impact fire occurred. The pilot and passenger were fatally injured. The aircraft crashed 15 nautical miles southwest of Brockway, Montana. Dark night and variable meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was in effect at the time. The flight, which was business in nature, was to have been operated under 14CFR91, and originated from Lacrosse, Wisconsin approximately 1632.

At 1930:59, N22CN requested a descent from flight level (FL) 240 to FL 220 and this request was granted by the Salt Lake Air Route Traffic Control (ARTCC) sector controller. Radar data showed the aircraft at FL 220 shortly thereafter.

The Salt Lake ARTCC sector controller reported in a statement that "after working the sector for about 10 minutes I saw N22CN's altitude go up 500 feet. I was getting ready to tell him, when I saw his target disappear and the data block went into coast track." The controller's attempts to contact the aircraft were unsuccessful (refer to attached statement).

The mode "C" altitude readout from the aircraft showed a consistent altitude of FL 220 with only minor 100 foot deviations on four occasions during the 12 second interrogations by the Salt Lake ARTCC radar between 1935:53 until shortly after 1944:18.

At 1944:30, small up and down fluctuations of altitude up to 300 feet were noted on the mode "C" radar returns. At 1949:31, the mode "C" altitude peaked at 500 feet above FL 220, followed by a readout of 100 feet above FL 220 at 1949:43, and a final mode "C" readout of 100 feet below FL 220 at 1949:55. The mode "C" readout and transponder target were then lost. Salt Lake ARTCC radar recorded 23 additional primary (non transponder) targets before losing the aircraft (refer to ATTACHMENT RD-I).

The next and last known radio contact received from the aircraft was an unintelligible transmission received at 1950:39.

Witnesses reported observing a fireball descending steeply in an easterly direction (refer to attached witness statements).

### PERSONNEL INFORMATION

A personal friend of the pilot reported that the pilot had logged approximately 1,200 hours of total flight time of which an estimated 300-400 hours were in the Beech Duke aircraft and approximately 170 hours were in the PA-31T1. He indicated that the pilot had been flying N22CN on a weekly basis since its purchase.

The pilot received ground and flight instruction from an individual providing contractual training during the month of June of 1994. No unusual attitude recovery training was conducted. The contractor, who travelled to Jefferson City, reported that he provided 24 hours of ground school instruction and approximately 10 hours of flight training (conducted in N22CN) over a three-day period, and that the pilot had no previous turbine experience at that time. The contractor signed off the pilot on June 22, 1994.

As the aircraft was reported to have departed approximately 0800 from Jefferson City, the pilot would have been engaged in flight/ crew duty conditions for a period of time exceeding 12 continuous hours.

#### AIRCRAFT INFORMATION

The aircraft's airframe and powerplant logbooks were reported to be on board the aircraft at the time of the accident. No evidence of their remains was discovered during the on-site examination.

According to FAA records, the aircraft was purchased by and registered to the pilot on July 20, 1994. Maintenance documentation retained by Jefferson City Flying Service, Inc., showed a pre-purchase inspection dated May 31, 1994, at an aircraft total time of 3223 hours (158.5 hours Hobbs time). Additional records from the same source showed 27 write ups on the aircraft with corresponding action taken. These writeups were dated September 6, 1994, coincident with the date on which a Piper programmed inspection 100-hour cycle checklist was signed off. Aircraft total time noted on the first page of the check sheet was 3330.9 hours with a corresponding Hobbs time of 264.2 hours noted. The most recent maintenance record was a single writeup corrected on November 16, 1994, at a recorded Hobbs time of 338.9 hours.

A passenger occupying the front right seat of the aircraft on the morning of November 29th, while the aircraft was en route to Appleton, Wisconsin, reported the following event: "While en route and prior to our descent, we were on auto-pilot. The plane suddenly went into a hard right bank. (The pilot) turned off the auto-pilot and manually corrected back on course." "After the correction we (the pilot and front right passenger) commented that it had never done that before. (The pilot) put on the auto-pilot again and shortly it began a right bank. (The pilot) turned off the auto-pilot for a short time and again activated it with the same results commenting he would have it looked at" (refer to statement TB attached).

#### METEOROLOGICAL INFORMATION

Winds aloft for Glasgow, Montana, were recorded as follows:

Observation time: 1900 hours mountain standard (11/29/94)

	altitude	speed	direction (true)	18,000'	60 kts	310 deg	
19,000'	60 kts	308 deg	20,000'	62 kts	306 deg	21,000'	62 kts
305 deg	22,000'	68 kts	309 deg	23,000'	80 kts	317 deg	
24,000'	93 kts	320 deg					

The Glasgow radiosonde launch point bears 322 degrees magnetic and 74 nautical miles from the accident site.

#### COMMUNICATIONS

No abnormal communications were noted until 1950:39 hours when Salt Lake ARTCC received an unintelligible radio transmission associated with N22CN (refer to attached communication transcripts).

#### WRECKAGE AND IMPACT INFORMATION

The ground impact site of the fuselage was established by a hand-held global positioning system (GPS) receiver as 47 degrees 05.184 minutes north latitude and 105 degrees 56.595 minutes west longitude at an elevation of approximately 2,975 feet above mean sea level. This

location was 15 nautical miles south-southwest of Brockway, Montana. The terrain at the site was characteristic of gently rolling agricultural farmland. Fragments of wreckage were recovered during the on-site phase of the investigation and were distributed along an approximate 090 degree magnetic bearing line.

The fuselage was observed to be inverted and oriented along a 245/065 degree magnetic bearing line (nose southwest). The nose cone/radar, empennage and associated control surfaces aft of the aft pressure bulkhead, and left/right wing sections outboard of the flaps, were absent. The fuselage was extensively fire damaged consequently Supplement "D" was not completed (refer to photographs 1 through 4). The nose baggage door was observed detached from the fuselage and lying on the ground approximately 15 feet west of its baggage compartment and was observed to be free of any sooting or fire damage. Both engines were found within their respective nacelles with their respective propeller assemblies and spinners attached. All three blades of the right propeller remained attached to the spinner and were in a near feathered position (refer to photograph 5). One of the three blades of the left propeller was separated and observed lying next to the fuselage. The two remaining blades were in a near feathered position (refer to photographs 6/7). Several ground slash marks consistent with a propeller blade strike were observed in the soil 11 feet southwest of the right propeller spinner (refer to page 3, Supplement I).

Twenty-four additional pieces of wreckage from the aircraft were located. The GPS latitude and longitude of each component was recorded along with a general description of the item and estimated weight (refer to Attachment AC-I and photographs 8 through 31). The location of these pieces of wreckage were plotted and the lightest pieces were located furthest east at a distance of 14,150 feet from the fuselage ground impact site (refer to CHART I). No significant evidence of sooting was observed on any of these 24 pieces of wreckage.

The previously referenced pieces were collected and returned to the ground impact site where the aircraft was reconstructed in its inverted attitude. Examination of the outboard wing separation surfaces for both left and right wings revealed downward bending consistent with high negative loading (refer to photographs 32 through 35). Additionally, reconstruction of sections of the elevator assembly revealed extensive downward bending of the right elevator consistent with high negative loading (refer to photograph 36).

A second reconstruction and examination of the wreckage was conducted April 18th during which several pieces of interior cabin material recovered from the vicinity of the fuselage ground impact site, a seat headrest, a seat armrest, and a piece of interior plastic with curtain fasteners, were examined. These items were found to be free of any fire damage or soot accumulation. The kerosene-fueled Janitrol Model B3040 heater, which had been found in the nose of the aircraft at the ground impact site, was re-examined. It was observed to have sustained crushing impact damage as well as extensive fire damage. The portion of the stainless steel outer shell upon which the data plate was affixed was relatively free of soot and fire damage (refer to photograph 37).

#### MEDICAL AND PATHOLOGICAL INFORMATION

Post mortem examination of the pilot and passenger was conducted by Kenneth H. Mueller, M.D., on November 30, 1994, at the facilities of Saint Vincent Hospital, Billings, Montana. The post mortem report on the pilot stated in part that "The lungs do not show any evidence of soot in the large airways nor is there any evidence of soot in the mouth or throat." Additionally,

microscopy of both occupant's lungs revealed no evidence of soot.

Toxicological evaluation of samples from the pilot was conducted by the Department of Defense, Armed Forces Institute of Pathology. Testing for Carbon Monoxide and Cyanide was not accomplished and testing for ethanol was negative. Drug testing yielded a positive for antihistamine, i.e., Chlorpheniramine (refer to attached Toxicology report).

Toxicological evaluation of samples from the passenger could not be accomplished due to the unsuitability of the specimens (refer to attached toxicology report).

## TESTS AND RESEARCH

A trajectory study was conducted by the Safety Board's Office of Research and Engineering. The study was based upon radar data, winds aloft, and the ground location of wreckage components. The study indicated that the breakup of the aircraft occurred "at an altitude slightly lower than the last recorded altitude (0249:55 at FL 219) and a location compatible with the initial primary radar returns after the transponder beacon was lost (0250:07)." The study also showed the aircraft beginning a tight right hand turn immediately after the last mode "C" transponder target (refer to attached Trajectory Study).

## ADDITIONAL INFORMATION

On site examination of the wreckage was conducted on December 1/2, 1994, after which the wreckage was conditionally released in writing to Mr. Chris Layton of Bierman-Condray, Inc., for the purposes of recovery and storage (refer to NTSB Form 6120.15[A]). The second examination of the wreckage was conducted on April 18th at the facilities of Loss Management Services, Inc., in St. Louis, Missouri, where the aircraft was being stored. The aircraft was verbally released to a representative of Loss Management at the end of that day and written release of the full wreckage was initiated April 28, 1995 (refer to NTSB Form 6120.15[B]).

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	47, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	06/30/1993
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	1200 hours (Total, all aircraft), 170 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

Aircraft Make:	PIPER	Registration:	N22CN
Model/Series:	PA-31T1 PA-31T1	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	31T-7904049
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	09/06/1994, 100 Hour	Certified Max Gross Wt.:	8700 lbs
Time Since Last Inspection:		Engines:	2 Turbo Prop
Airframe Total Time:		Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	PT6A-11
Registered Owner:	FAIN, CHARLES, B.	Rated Power:	500 hp
Operator:	FAIN, CHARLES, B.	Operating Certificate(s) Held:	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	MLS, 2628 ft msl	Distance from Accident Site:	39 Nautical Miles
Observation Time:	1948 MST	Direction from Accident Site:	163°
Lowest Cloud Condition:	Scattered / 7000 ft agl	Visibility	10 Miles
Lowest Ceiling:	Overcast / 8000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	140°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	-3° C / -10° C
Precipitation and Obscuration:			
Departure Point:	LACROSSE, WI (LSE)	Type of Flight Plan Filed:	IFR
Destination:	KALISPELL, MT (FCA)	Type of Clearance:	IFR
Departure Time:	1732 CST	Type of Airspace:	Class A

## Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	In-Flight
Ground Injuries:	N/A	Aircraft Explosion:	On-Ground
Total Injuries:	2 Fatal	Latitude, Longitude:	

## Administrative Information

**Investigator In Charge (IIC):** STEVEN A MCCREARY **Report Date:** 04/29/1996

**Additional Participating Persons:** THOMAS HARRIS; HELENA, MT  
THOMAS A BERTHE; S. BURLINGTON, VT  
TIM HARDEE; OLATHE, KS

**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](mailto:pubinq@ntsb.gov), or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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