



National Transportation Safety Board Aviation Accident Final Report

Location:	PAGOSA SPRINGS, CO	Accident Number:	DEN01FA161
Date & Time:	09/24/2001, 0904 MDT	Registration:	N161RB
Aircraft:	Piper PA-31-350	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The airplane was on a non-scheduled cargo flight which was projected to fly an approximate 240 degree course for 92 nm. The accident site was located on a heavily forested steep mountain side, 15 to 16 nm north of the airplane's projected course. The debris field began at an east-west ridge line, and progressed for 300 feet on a 010 degree track to the downed airplane. Examination of the airframe and engines revealed no evidence of preimpact discrepancies. The accident site was in an area where the Fall color of the aspens was at its peak. Additionally, it was an area where elk were sometimes observed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the flight crews' intentional low altitude flight, and failure to maintain obstacle clearance.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: MANEUVERING

Findings

1. (C) LOW ALTITUDE FLIGHT/MANEUVER - INTENTIONAL - FLIGHTCREW
 2. (C) CLEARANCE - NOT MAINTAINED - FLIGHTCREW
 3. OBJECT - TREE(S)
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Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings

4. TERRAIN CONDITION - MOUNTAINOUS/HILLY

Factual Information

HISTORY OF FLIGHT

On September 24, 2001, at 0904 mountain daylight time, a PA-31-350, N161RB, was destroyed following impact with terrain while maneuvering near Pagosa Springs, Colorado. The two commercial pilots received fatal injuries. Key Lime Air of Denver, Colorado, was operating the on demand domestic cargo flight under 14 CFR Part 135. Visual meteorological conditions prevailed for the cross-country flight that originated from Alamosa, Colorado, 24 minutes before the accident. A visual flight rules flight plan (VFR) had been filed, with Durango, Colorado, as its destination, but it was never activated.

The operator said that the airplane was scheduled to depart Centennial Airport in Denver, Colorado (on its first flight of the day) at 0715. Denver Flight Service Station (FSS) reported that the pilot-in-command (PIC) had filed two VFR flight planes; one from Centennial Airport for 0715; and later, a second from Alamosa, Colorado, at 0815. Neither of them were opened. Fixed base operator (FBO) personnel at Alamosa, Colorado, reported the airplane departed for Durango, Colorado, at approximately 0840.

The operator reported the aircraft was overdue at its destination, and an alert notice (ALNOT) was issued by the Denver FSS. The United States Forest Service (USFS) dispatch received a report of smoke and a potential forest fire at 0904. Upon investigation, USFS personnel discovered the airplane's wreckage.

PERSONNEL INFORMATION

The PIC started working for the operator on February 21, 2001. His college degree was in Aviation Maintenance Management. He was an instrument rated commercial pilot, and had earned his airframe and power plant mechanic certificates. At the time of the accident, he had accumulated approximately 1,962 hours of flight experience of which approximately 614 hours were in this make and model airplane. He held a first class medical certificate dated January 10, 2001; he was required to wear corrective lenses while performing the duties of a pilot. He successfully completed a FAR Part 135 Airman Proficiency Check on February 28, 2001.

The second-in-command (SIC) pilot started working for the operator on November 21, 2000. He was an instrument rated commercial pilot with approximately 468 hours of flight experience at the time of the accident; he had 207 hours of flight time in this make and model airplane. He held a first class medical certificate dated November 6, 2000, which he had no limitations. He successfully completed a FAR Part 135 Airman Proficiency Check on December 3, 2000.

The operator said that their records indicated that the two pilots had flown together on 17 different days for 91 flight legs.

AIRCRAFT INFORMATION

The airplane was a twin engine, propeller-driven, retractable gear, cargo configured airplane, which was manufactured by the Piper Aircraft Company in 1979. It was certificated for a maximum gross takeoff weight of 7,000 pounds (approximate empty weight of 4,000 pounds). The airplane was powered by two 350 horsepower Textron Lycoming fuel injected,

turbocharged, reciprocating engines (TIO-540-J2BD and LTIO-540-J2BD). Aircraft maintenance records indicated that the last 100 hour inspection was accomplished on August 27, 2001. The airframe had accumulated approximately 9,022 hours of flight time, at the time of the accident.

Cargo manifest records indicated that the airplane was loaded with approximately 461 pounds of cargo at the time of the accident.

METEOROLOGICAL INFORMATION

At 0853, the weather conditions at the Animas Air Park (elevation 6,684 feet), Durango, Colorado, 215 degrees 28 nautical miles (nm) from the accident site, were as follows: wind calm; visibility 10 statute miles; cloud condition clear; temperature 57 degrees Fahrenheit; dew point 37 degrees Fahrenheit; altimeter setting 30.45 inches. At 0852, the weather conditions at the San Luis Valley Regional/Bergman Field (elevation 7,539 feet), Alamosa, Colorado, 135 degrees 25 nm from the accident site, were as follows: wind calm; visibility 10 statute miles; cloud condition clear; temperature 46 degrees Fahrenheit; dew point 34 degrees Fahrenheit; altimeter setting 30.51 inches.

WRECKAGE AND IMPACT INFORMATION

The airplane was found on the east face of Graham Peak (N37 degrees, 29.68'; W107 degrees, 21.01'; elevation 10,404 feet) in the Rio Grande National Forest, approximately 25 miles northwest of Pagosa Springs, Colorado. The terrain at the accident site was steeply rising to the west and gently rising to the north. The impact area was forested with 50 to 70 foot high conifers which had 12 to 18 inch diameters. An approximate 300 foot longitudinal path of downed vegetation (large trees and many slashed 4 to 5 inch in diameter branches) and airplane debris, oriented 010 degrees, led to the downed aircraft. The initial topped trees were on an east-west oriented ridge line which was rising to the west.

The Federal Aviation Administration (FAA) inspector, who went to the accident scene, reported that the outboard portions of the airplane's wings (from the inboard end of the ailerons to the wingtips) were found approximately 75 feet north of the beginning of the debris trail. He said that the unburned empennage, with the fuselage's entrance door, was found separated from the main cabin and cockpit area. The elevator trim drum forward extension measured 1 1/8 inches and displayed 8 threads; the airplane manufacturer's representative said this is consistent with a pitch trim setting of full nose up. The forward two-thirds of the fuselage and cockpit area, along with the inboard two-thirds of both wings (including both engines) were severely damaged by postimpact fire. The airplane manufacturer's representative, who looked at the wreckage in Greeley, Colorado, said that damage to the right outboard wing section indicated the airplane impacted the trees nose high in a right turn.

All of the airplane's major components were accounted for at the accident site. The flight control surfaces were all identified. Flight control continuity was not established due to impact and thermal damage. The flaps and landing gear were determined to be in the up position. The cockpit area and instrument panel were destroyed by impact damage and postimpact fire. The engine control quadrant showed severe thermal damage; both throttles and propeller controls were found full forward. The mixture controls were loose and their position was undetermined; however, their thermal damage appeared consistent with the other levers when placed in the full rich position.

The left propeller was separated from its engine. Rotation of the engine and its turbocharger

were unsuccessful due to thermal damage. All engine accessories were intact, but were destroyed by fire. Borescoping of the engine, by the engine manufacturer's representative, found no discrepancies. The left propeller blades displayed chordwise and spanwise scratches, and the blade tips were bent aft and one tip was curled.

The right engine received more thermal damage than the left engine. Attempts to rotate the engine and its turbocharger were unsuccessful; borescoping the engine and examining it through melted and burned areas identified no discrepancies. All engine accessories were intact, but were destroyed by fire. The right propeller assembly remained attached to the engine, and sustained extensive impact and thermal damage. All three blades exhibited leading edge impact nicks and light chordwise scratches.

No preimpact engine or airframe anomalies, which might have affected the airplane's performance, were identified.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on both pilots by the Division of Forensic Pathology, Montrose Memorial Hospital, Montrose, Colorado, on September 27, 2001.

The FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma, performed toxicology tests on both pilots. According to CAMI's report (#200100296001), the PIC's kidney sample was tested for drugs with negative results; carbon monoxide and cyanide tests were not performed. The following volatiles were found in muscle and kidney samples: ethanol, acetaldehyde, and N-propanol. CAMI personnel reported that because of the quality of the samples, the presence of alcohol and its metabolites could not be limited to decomposition processes.

CAMI's report on the SIC (#200100296002), included testing for carbon monoxide, cyanide, volatiles, and drugs; all test results were negative.

TESTS AND RESEARCH

Postaccident research indicates that the airplane's flight path from Alamosa, Colorado, to Durango, Colorado, would have been approximately 240 degrees heading for 92 nm. The accident site was located approximately 15 to 16 nm north of this projected course, and the downed vegetation and airplane's debris field was on a 010 degree orientation. The Pagosa Springs Stevens Field Airport manager said that people commonly fly into the valley to look at the golden aspens in the Fall, and sometimes to look for elk. He said that on the day of the accident, the aspens were absolutely gorgeous.

ADDITIONAL DATA

The airplane, including all components and logbooks, was released to a representative of the owner's insurance company on March 13, 2002.

Pilot Information

Certificate:	Commercial	Age:	24, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 1 None	Last FAA Medical Exam:	01/10/2001
Occupational Pilot:		Last Flight Review or Equivalent:	02/28/2001
Flight Time:	1962 hours (Total, all aircraft), 614 hours (Total, this make and model), 1871 hours (Pilot In Command, all aircraft), 251 hours (Last 90 days, all aircraft), 69 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Commercial	Age:	26, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 1 None	Last FAA Medical Exam:	11/06/2000
Occupational Pilot:		Last Flight Review or Equivalent:	12/03/2000
Flight Time:	468 hours (Total, all aircraft), 208 hours (Total, this make and model), 190 hours (Pilot In Command, all aircraft), 59 hours (Last 90 days, all aircraft), 27 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N161RB
Model/Series:	PA-31-350	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	31-7952097
Landing Gear Type:	Retractable - Tricycle	Seats:	2
Date/Type of Last Inspection:	08/27/2001, 100 Hour	Certified Max Gross Wt.:	7000 lbs
Time Since Last Inspection:	32 Hours	Engines:	2 Reciprocating
Airframe Total Time:	9022 Hours at time of accident	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	TIO-540-J2BD
Registered Owner:	EDB Air, Inc.	Rated Power:	350 hp
Operator:	KEY LIME AIR	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	KY7A

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KDRO, 6684 ft msl	Distance from Accident Site:	28 Nautical Miles
Observation Time:	0853 MDT	Direction from Accident Site:	215°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.45 inches Hg	Temperature/Dew Point:	14° C / 3° C
Precipitation and Obscuration:			
Departure Point:	ALAMOSA, CO (KALS)	Type of Flight Plan Filed:	VFR
Destination:	DURANGO, CO (K00C)	Type of Clearance:	None
Departure Time:	0840 MDT	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	37.494722, -107.350278

Administrative Information

Investigator In Charge (IIC): James F Struhsaker **Report Date:** 07/25/2002

Additional Participating Persons: Dale Shuell; Denver, CO
Jeffrey R Poschwatta; Textron Lycoming; Kent, WA
Michael C McClure; The New Piper Aircraft, Inc.; Arlington, TX

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.nts.gov/pubdms/>.

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).