National Transportation Safety Board
Aviation Accident Final Report

Location:	Adjuntas, PR	**Accident Number:**	MIA07FA042
Date & Time:	01/15/2007, 0415 AST	**Registration:**	N90KB
Aircraft:	Partenavia P 68C	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The non-instrument rated pilot departed VFR on a dark night at 0359, with an adequate fuel supply for the intended flight, and proceeded in a south-southeasterly heading (approximately 150 degrees) climbing to a maximum altitude of 4,700 feet msl. The flight continued on the south-southeasterly heading, descended to 4,500 feet msl, then descended gradually to 3,800 feet msl where radar contact was lost at 0411:37. The flight continued 4.6 nautical miles on the south-southeasterly heading, and impacted trees in upslope mountainous terrain while on a magnetic heading of 150 degrees. The airplane was destroyed by impact and a postcrash fire; the accident site was located north of, and approximately 146 feet below an east-west oriented ridge line. The tree elevation was 3,299 feet msl, while the elevation at a ridge south of the site was 3,445 feet msl. Cloud tops in the area were calculated to be about 4,000 feet msl. Examination of the airplane structure, flight controls, engines, propellers, and systems revealed no evidence of preimpact failure or malfunction. The altimeter settings for the departure and destination airports were 30.02 inches Hg and 30.01 inches Hg, respectively. The altimeter was found positioned to 29.91 inches Hg. This error would have resulted in the altimeter reading 100 feet lower than if the correct altimeter setting was entered.

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 altitude/clearance with mountainous terrain for undetermined reasons during a normal descent under instrument meteorological and dark night conditions.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - NORMAL

Findings
1. WEATHER CONDITION - CLOUDS
2. LIGHT CONDITION - DARK NIGHT
3. TERRAIN CONDITION - MOUNTAINOUS/HILLY
4. ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
5. (C) REASON FOR OCCURRENCE UNDETERMINED

Factual Information

HISTORY OF FLIGHT

On January 15, 2007, about 0415 Atlantic standard time, a Partenavia P 68C, N90KB, registered to and operated by a private individual, collided with trees then mountainous terrain near Adjuntas, Puerto Rico. Instrument meteorological conditions prevailed in the area of the accident site, and no flight plan was filed for the 14 Code of Federal Regulations (CFR) Part 91 personal flight from Rafael Hernandez Airport (TJBQ), Aguadilla, Puerto Rico, to Mercedita Airport (TJPS), Ponce, Puerto Rico. The airplane was substantially damaged by impact and a postcrash fire, and the certificated commercial pilot and one passenger were killed. The flight originated about 0359, from TJBQ.

There were no known witnesses who saw the aircraft depart or who witnessed the accident. The pilot intended on flying to TJPS for the purpose of picking up a friend/relative of his wife, who was scheduled to arrive there on a commercial flight.

Recorded radar data depicting non-correlated radar returns (1200 beacon codes), indicate a flight departed TJBQ at approximately 0359, and proceeded in a south-southeasterly direction (approximately 150 degrees) between the first (0359:24) and last (0411:37) radar targets, with minor deviation from a straight line noted. The flight climbed to a maximum altitude of 4,700 feet mean sea level (msl), which occurred at 0405:24, and remained at that altitude for three successive radar returns, or until 0405:48. The radar data indicates the airplane descended to approximately 4,500 feel msl, and remained at that altitude for 9 of 11 radar returns (each 12 seconds apart) from 0406:24, until 0408:37. From 0408:49, to 0411:37 (last radar return), 15 radar returns recorded the airplane descending from 4,400 to 3,800 feet msl. The 15 returns each approximately 12 seconds apart did not indicate an altitude decrease greater than 100 feet between each of the returns. Further review of the radar data in 1 minute increments from 0405:36, to 0411:37 (last radar return), revealed the ground speed for each of the minute increments varied between approximately 132 and 149 knots.

The airplane impacted trees then mountainous terrain during dark night conditions. The accident site location was nearly aligned with all recorded radar targets for the entire flight, and was located 151 degrees and approximately 4.6 nautical miles from the last non-correlated radar return. The destination airport was located 15.83 nautical miles southeast from the accident site.

The civil air patrol (CAP) became involved in a search for the airplane on January 17, 2007, at approximately 1700, and the airplane was first spotted during an aerial search on January 20, 2007. The accident site was reached by search and rescue personnel the following day.

PERSONNEL INFORMATION

The pilot, age 70, held a Federal Aviation Administration (FAA) commercial pilot certificate with ratings for airplane single and multi-engine land. He held a FAA second class medical certificate issued June 10, 2006, with a restriction to wear corrective lenses. He listed a total time of 13,000 hours on the application for his last medical certificate.

The pilot's son reported that he did not find his father's current pilot logbook. He did however find his father's pilot logbook that documented flying from 1970 to 1998.

The passenger was not a certificated pilot.

AIRCRAFT INFORMATION

The twin-engine, fixed gear airplane was manufactured in April 1986, by Partenavia Construzioni Aeronautiche S.p.A. as model P 68C, and was designated serial number 365. It was powered by Lycoming IO-360-A1B6, 200 horsepower engines and equipped with Hartzell constant speed propellers.

NTSB review of the maintenance records revealed the pitot-static, transponder, and encoding altimeter were last inspected in accordance with (IAW) 14 CFR Part 43 Appendixes E and F on March 7, 2006. The airplane was last inspected IAW an annual inspection using the on October 12, 2006. The aircraft total time at that time was 9,611.6 hours. Although the exact aircraft total time at the time of the accident was not determined, the aircraft total time 5 days before the accident was approximately 9,671 hours.

METEOROLOGICAL INFORMATION

According to FAA personnel, the pilot did not obtain a preflight weather briefing.

The NTSB Meteorology Factual Report (Weather Factual) indicates there were no pilot reports over Puerto Rico between the accident flight times. The area forecast for San Juan Flight Information Region (FIR) was for scattered clouds at 2,500 and 5,000 feet msl, occasional broken with tops to 8,000 feet msl, and isolated rain showers. The terminal area forecast (TAF) for the destination airport (TJPS) valid for the accident flight time indicates visibility greater than 6 miles with clear skies.

The NTSB Weather Factual also indicates that at 0415 (time of the accident), low cumulus clouds were identified in the vicinity of the departure airport, with another area of low stratiform clouds over the interior portions of Puerto Rico from the accident site, to north and east-northeast of the destination airport. The cloud tops in the accident site area were in the range of 4,000 feel msl. Weather surveillance radar was not operating at the time of the accident; therefore, no determination could be made as to whether there was any precipitation surrounding the accident site area.

An aviation routine weather report (METAR) taken at the departure airport (TJBQ) at 0350 (approximately 9 minutes before the accident flight departed), indicates the visibility was unrestricted at 10 statute miles, scattered clouds existed at 3,000 feet, the temperature and dew point were 22 and 21 degrees Celsius respectively, and the altimeter setting was 30.02 inches of Mercury (Hg). A METAR taken at the destination airport (TJPS) also at 0350 indicates the visibility was 8 statute miles, few clouds existed at 2,500 feet, the temperature and dew point were 22 and 18 degrees Celsius respectively, and the altimeter setting was 30.01 inches of Hg.

At the time of the accident, the moon was 5.5 degrees above the horizon, at an azimuth of 120 degrees. The phase of the moon was waning crescent with 14 percent of the Moon's visible disk illuminated.

COMMUNICATIONS

The pilot did not establish contact with any FAA air traffic control (ATC) facility during the flight.

WRECKAGE AND IMPACT INFORMATION

Examination of the accident site revealed the airplane collided with trees then impacted up

sloping mountainous terrain on the north side of an east-west oriented ridge line. The ridge line was located south of the impact location. The energy path thru the trees was oriented on a magnetic heading of 150 degrees, which was in-line with all radar targets associated with the accident flight and also correlated with the heading between the last radar return and the accident site location. The wreckage came to rest heading 205 degrees magnetic; fire damage to the wreckage and surrounding area was noted. The first trees contacted were located at an elevation of 3,299 feet msl, while the up sloping terrain contact point elevation was 3,339 feet msl. The elevation of the top of the ridge line located south of the accident site was 3,445 feet msl. Debris consisting of an engine cowling, and window frame were noted along the energy path.

Examination of the wreckage revealed the cockpit and cabin were consumed by the postcrash fire. Both wings were fragmented and heat damaged. All components necessary to sustain flight remained attached or were found in close proximity to the main wreckage. The vertical stabilizer remained attached by control cables, and the rudder remained attached to the vertical stabilizer. Impact damage to the leading edge of the vertical stabilizer was noted. Tree impacts to both sides of the horizontal stabilator caused it to separate from the attach bulkhead. No evidence of preimpact failure or malfunction was noted to the primary flight control cables, or to the flap cables. The flap actuator was found in the retracted position. The stabilator trim actuator was positioned between 4 and 8 degrees tab trailing edge down, or aircraft nose-up, and the rudder trim was positioned approximately 24 degrees tab trailing edge left, or aircraft nose right. The left engine remained attached to the wing but the propeller separated from the engine; the propeller was found in close proximity to the engine. The right engine was partially separated from the wing and came to rest beneath the wing with the propeller attached.

The cockpit was fragmented and fire damaged. Separated flight and engine instruments that were recovered consisted of the altimeter, vertical speed indicator (VSI), directional gyro (DG), attitude indicator, and dual tachometer (tachometer). The altimeter was indicating 2,840 feet with an altimeter setting of approximately 29.91 inches Hg, the VSI was indicating approximately 2,000 feet-per-minute (fpm) descent, and the DG was indicating a heading of 196 degrees. The tachometer was found indicating 2,700 rpm for the left engine and 800 rpm for the right engine. The fuel selector panel was impact separated, though a section of cable remained attached to the right fuel selector knob. The left fuel selector knob moved freely and was found positioned to the "Eng Shut Off" position, though the left fuel selector valve which remained secured to the wing was found in the "normal on" position. The right fuel selector knob could not be moved and was positioned to the "RH Tank" position, while the separated and impact damaged right fuel selector valve was found in the "crossfeed" position. Additionally, a portion of the right fuel selector valve was separated and not located. The left fuel selector valve and remaining portion of the right fuel selector valve were free of obstructions. The altimeter, DG, attitude indicator, and two engine recording instruments were retained for further examination.

Examination of the left engine at the accident site revealed the crankshaft was fractured aft of the propeller flange. Impact and fire damage precluded rotation of the engine; however, borescope examination of all cylinders revealed no anomalies. Disassembly of the engine at the accident site was not possible. Fire damage to components of the ignition system precluded testing; however, the top and bottom spark plugs were visually inspected and all were noted to be worn. The top plugs exhibited light brown coloration, while the bottom plugs exhibited

normal coloration. Disassembly and/or inspection of the fuel injection system components consisting of the servo fuel injector, distributor valve, and fuel injector nozzles revealed no evidence of preimpact failure or malfunction.

Examination of the left propeller at the accident site revealed one blade was bent aft approximately 40 degrees beginning at mid span, exhibited leading edge twisting along its length, and rotated approximately 90 degrees in the hub. The other blade was bent aft slightly and exhibited leading edge twisting beginning about 8 inches inboard from the blade tip.

Following removal of the partially attached right engine, examination of it at the accident site revealed crankshaft, camshaft, and valve train continuity. Suction and compression was noted in all cylinders during hand rotation, though No. 2 cylinder suction and compression was weak due to impact damage to the cylinder. Borescope examination of all cylinders revealed no anomalies. Impact and fire damage to the left magneto precluded testing; however, hand rotation of the right magneto resulted in spark at all distributor block towers. All spark plugs were inspected and exhibited gray coloration and worn normal appearance. Disassembly and/or inspection of the fuel injection system components consisting of the servo fuel injector, distributor valve, and fuel injector nozzles revealed no evidence of preimpact failure or malfunction.

Examination of the right propeller at the accident site revealed both propeller blades rotated freely in the propeller hub. One propeller blade was in the feathered position while the other blade was at low pitch. The piston/cylinder was separated and the spinner was crushed. The pitch change rod was bent on the front side of the hub and fractured adjacent to the aft side of the piston. One propeller blade was bent aft and the leading edge was twisted towards low pitch. The other blade exhibited a mild aft bend, twisting towards low pitch of the leading edge near the blade tip, and damage to the trailing edge of the blade.

With the exception of the retained flight and engine instruments, the wreckage was not recovered.

MEDICAL AND PATHOLOGICAL INFORMATION

Postmortem examinations of the pilot and passenger were performed by the Instituto De Ciencias Forenses De Puerto Rico. The cause of death for the pilot and passenger was listed as "Quemaduras corporales y trauma corporal" or burns and trauma to the body.

Specimens from the pilot were not submitted to the FAA Bioaeronautical Sciences Research Laboratory, located in Oklahoma City, Oklahoma.

Toxicological testing of specimens of the pilot and passenger was performed by the Instituto De Ciencias Forenses De Puerto Rico. Specimens of the pilot and passenger were tested for volatiles, cocaine, opiates; the results for both were negative. Testing for carbon monoxide could not be performed on specimens of the pilot. Carbon monoxide testing was not performed on specimens of the passenger.

TESTS AND RESEARCH

The recovered engine monitoring instruments that by design record and retain certain engine parameters were submitted to the Safety Board's Office of Research and Engineering for downloading. The units by default record a data record once a second, but this setting can be changed to record at either a longer interval or the record function can be turned off. No recorded data was retained; however, the computer chips were found to be functional.

The retained altimeter, DG, and attitude indicator were examined with NTSB oversight. Heat and impact damage to the attitude indicator precluded bench testing. Disassembly inspection of the attitude indicator and DG revealed no evidence of preimpact failure or malfunction. Examination of the rotor and rotor housings from the DG and attitude indicator revealed no evidence of rotational scoring. Visual inspection of the faceplate of the altimeter revealed no evidence of needle contact marks. The altimeter was placed in a test chamber as received and taken to 6,500 feet, but no movement of the 10,000, 1,000, or 100 foot pointers was noted. Partial disassembly of the altimeter revealed the 100 foot pointer was separated from the shaft. The unit was again placed in the test chamber and without the 100 foot pointer attached, was taken to 7,500 feet. No movement of the 10,000 or 1,000 foot pointers was noted. Disassembly inspection of the altimeter revealed impact damage; there was no evidence of preimpact failure or malfunction.

As previously reported, the altimeter settings at the departure and destination airports about the time of departure were 30.02 and 30.01 inches Hg, respectively, and the as found altimeter setting was 29.91 inches Hg. The as found setting would have resulted in an approximate 100 foot error in altitude, i.e., the altimeter would have been reading approximately 100 feet lower than it would have been with the correct altimeter setting.

Although the airplane type certificate holder (Vulcanair) identified reliability issues pertaining to the original fuel selector valves, the accident airplane was equipped with new fuel selector valves (P/N NV7.001-59C) which were installed on October 3, 2006, IAW Service Instruction No. 69, Revision 1. Following installation of the new valves, rigging of the fuel selector cables and operational testing of the fuel control system was performed. The new valves were designed so that the detent from the control knob in the cockpit was more perceptible, they provided better long term reliability and improved mechanical interface of the fuel selector valve/fuel control receiver, and the correct position of the fuel selector valve is ensured during the operative phases. The aircraft had accumulated approximately 59 hours since the new fuel selector valves were installed. The maintenance records did not reflect any follow-on maintenance to the valves since installation; the last known maintenance occurred on January 10, 2007, or 5 days before the accident.

Fuel records indicate that the airplane was last fueled at the departure airport (TJBQ) on January 10, 2007; a total of 61 gallons of 100 low-lead fuel were added.

Pilot Information

Certificate:	Commercial	**Age:**	70, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With Waivers/Limitations	**Last FAA Medical Exam:**	06/01/2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	13000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Partenavia	**Registration:**	N90KB
Model/Series:	P 68C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	365
Landing Gear Type:	Tricycle	**Seats:**	6
Date/Type of Last Inspection:	10/01/2006, Annual	**Certified Max Gross Wt.:**	4387 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	9611.1 Hours as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C91A installed, not activated	**Engine Model/Series:**	IO-360-A1B6
Registered Owner:	Larry L. Galloway	**Rated Power:**	200 hp
Operator:	Larry L. Galloway	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	TJPS, 26 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	0350 AST	**Direction from Accident Site:**	134°
Lowest Cloud Condition:	Few / 2500 ft agl	**Visibility**	8 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	30°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.01 inches Hg	**Temperature/Dew Point:**	22°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Aguadilla, PR (TJBQ)	**Type of Flight Plan Filed:**	None
Destination:	Ponce, PR (TJPS)	**Type of Clearance:**	None
Departure Time:	0359 AST	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	18.147222, -66.798333

Administrative Information

Investigator In Charge (IIC):	Timothy W Monville	**Report Date:**	12/28/2008
Additional Participating Persons:	Lee Nieves; FAA/FSDO; San Juan, James M Childers; Textron Lycoming; Williamsport, PA		
Publish Date:	12/28/2008		
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/.		