Aviation Investigation Final Report

Location:	PLYMOUTH, Massachusetts	**Accident Number:**	NYC99FA216
Date & Time:	August 31, 1999, 19:22 Local	**Registration:**	N98FM
Aircraft:	Piper PA-34-200	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The pilot-under-instruction (PUI) was in the left seat, and the flight instructor was in the right seat for the multi-engine instructional flight. The PUI was performing a simulated engine-out approach, with the right engine set at zero thrust. On short final, the airplane's airspeed began to bleed off. The instructor told the PUI to add power, which he did, but because of insufficient rudder input, the airplane drifted to the right. The instructor announced he was taking control of the airplane, then took control of it, and the PUI relinquished control. Due to the low altitude, and with the airplane stabilized, the instructor decided to land the airplane in the grass next to the runway. However, the PUI grabbed the yoke, pulled back on it, and started screaming. Both pilots struggled for control, as the airplane went below minimum control airspeed, then struck the ground in a high right-angle of bank. Prior to the accident flight, the instructor had called an examiner to cancel the PUI's upcoming check ride. At that time, the instructor had characterized the PUI, when flying, as unpredictable, and someone who would 'do unusual things on his own.'

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flight instructor's inadequate remedial action, and the pilot-under-instruction's panic and subsequent interference with the flight controls.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (C) CONTROL INTERFERENCE - IMPROPER - DUAL STUDENT
2. (C) PANIC - DUAL STUDENT
3. (C) REMEDIAL ACTION - INADEQUATE - PILOT IN COMMAND(CFI)
4. AIRSPEED(VMC) - NOT MAINTAINED

Factual Information

HISTORY OF FLIGHT

On August 31, 1999, at 1922 Eastern Daylight Time, a Piper PA-34-200, N98FM, was destroyed during a simulated engine-out approach to Plymouth Municipal Airport (PYM), Plymouth, Massachusetts. The certificated flight instructor was seriously injured, and the certificated private pilot was fatally injured. Visual meteorological conditions prevailed at the time of the accident. No flight plan was filed for the local multi-engine instructional flight, which originated at Norwood Memorial Airport (OWD), Norwood, Massachusetts. The flight was conducted under 14 CFR Part 91.

According to witnesses, the airplane entered the traffic pattern, and completed about four circuits before the accident. Upon turning on final during each circuit, a radio call was made from the airplane stating that the airplane would be making a simulated engine-out approach.

One witness stated that he was in the run-up area prior to takeoff, and saw the accident airplane as it was approaching the runway. He further stated:

"He was slow on the approach. I watched as he passed us at 50/100 feet, and saw his port engine operating normally....The twin made no other radio call. Next I heard someone call that an aircraft had crashed. I turned back and saw flames begin to appear at the scene."

Another witness wrote that "it appeared that [the accident airplane] had made an approach and was going around. It was going slow, and climbed approximately 50 feet, and banked out of control, crashing into grass area on south side of Runway 6. It caught on fire, however, not on impact."

A third witness stated:

"...heard an increase in power and saw the aircraft banking hard to the right. The bank increased close to a 90-degree angle, and the right wing made contact with the ground. There was no fire or explosion at first. Then the aircraft burst into flames. The aircraft was approaching on Runway 6 (the active) and banked and made ground contact to the right of Runway 6 in the grass. The aircraft was probably 50/100 feet above the when it started the hard bank."

The flight instructor stated that towards the end of the flight, which was about 2 hours in duration, he had planned on having the private pilot, the pilot-under-instruction (PUI), fly two simulated single-engine approaches to a landing, then proceed back to the originating airport. During the simulated engine-out approaches, both engines would still be running, but the

manifold pressure on one would be set at 13 to 15 inches to simulate zero thrust from a feathered propeller. During the first approach, the flight instructor had the radios, and the PUI was flying the airplane. The PUI "did pretty good" on the approach. However, on short final, "right before the numbers," the airplane's airspeed started bleeding off, so the instructor told the PUI to add power. The PUI added power to arrest the airspeed bleed-off, and as he did so, the airplane drifted to the right. The PUI did not appear to add sufficient rudder to arrest the drift, so the instructor stated, "my plane," and took the controls, which the PUI relinquished.

After the flight instructor took the controls, he straightened the airplane out, and decided to land it in the grass next to the runway due to the low altitude. He remembered that everything was well under control, when he felt the yoke come back, and into his stomach. He looked over and saw the PUI's hands on the yoke, and asked him what he was doing. The PUI didn't respond, but started "screaming loudly; I never heard anything like it."

The flight instructor noted that although the PUI was older, he was still quite strong, and he found himself fighting the PUI for control of the airplane. The airplane pitched up, and "I tried my best to be able to get the plane level enough" to land, then remembered it sliding, and the sound of crushing metal.

When the airplane came to a stop, the flight instructor asked the PUI if he was alright. The PUI stated that he was okay, and asked what should they do. The flight instructor told him to "abandon ship," and pointed out a fire near the left engine.

The flight instructor exited the airplane, and started running towards a safe area. After about 100 feet, he turned around to see where the PUI was. He started running back toward the plane, then turned to the right to see if the PUI had passed him. He called out the PUI's name, and an explosion knocked him down. Then, there was a second explosion, and the flight instructor became engulfed in flames. He "rolled and rolled, but the fire wouldn't go out." While he was rolling, he saw the PUI emerge from the airplane, also engulfed in flames. The PUI asked for help, but the flight instructor couldn't help him due to his own situation. Shortly thereafter, helicopter rescue personnel, who had been practicing in the air traffic pattern, arrived and provided assistance.

The accident occurred during daylight hours, with initial ground strikes at 41 degrees, 54.38 minutes north latitude, 70 degrees, 43.96 degrees west longitude.

PERSONNEL INFORMATION

The instructor was a certificated commercial pilot, with airplane single engine land, multi-engine land, and instrument-airplane ratings. He was also a certificated flight instructor for single engine, and multi-engine airplanes, and instrument-airplane. According to his logbook, he had about 565 hours of total flight time, with 125 hours in multi-engine airplanes. He had flown approximately 240 hours as a flight instructor, with about 70 of those hours as a multi-engine flight instructor. The pilot's latest second class medical certificate was issued on

October 14, 1997.

The PUI was a certificated private pilot, with an airplane single-engine land rating. According to his logbook, he had about 380 hours of flight time, with approximately 35 hours in multi-engine airplanes. The pilot's latest third class medical certificate was issued on March 27, 1998.

Shortly after the accident, a Federal Aviation Administration (FAA) Designated Examiner telephoned an FAA Inspector about it. The examiner stated that on the morning of the accident, he had received a telephone call from the flight instructor, concerning the PUI. At that time, the instructor advised the examiner that the PUI would not be ready for an upcoming multi-engine check ride. He described the PUI as "unpredictable," who experienced "mental blocks," and at times, was "like someone pulled a shade down - forgets everything."

During a follow-up interview, the examiner also recalled that the instructor had stated: "I can't let him go. I thought he was over it - but I just can't let him go." He further reiterated that the PUI would perform something correctly, and then, "would change, and just do unusual things on his own."

AIRCRAFT INFORMATION

The most recent available information about the airplane indicated that the latest inspection was a 100-hour inspection, on July 23, 1999. At the time, the airplane's total time was 6,286.6 hours. Subsequent maintenance was performed on the airplane on July 30, 1999, at 6,355.5 hours. Hours of operation between the last recorded maintenance and the accident flight were not available due to the operator's cessation of operations.

WRECKAGE AND IMPACT INFORMATION

On-scene examination of the wreckage revealed that the airplane had initially contacted the ground about 140 feet to the right of, and about 1/3 of the way down Runway 06. Ground scars, about 130 feet long and oriented along a 115-degree magnetic heading, led to the wreckage. The wreckage was located at 41 degrees, 54.37 minutes north latitude, 70 degrees, 43.91 degrees west longitude. The right outboard section of wing had separated from the airframe, and the cockpit area had been consumed by fire. All flight surfaces were accounted for at the accident scene, and control continuity was established.

The flap handle was found in the first notch, consistent with 10 degrees of flaps. The rudder trim tab was extended 3/4 of an inch, which equated to approximately 9 degrees nose left, and the elevator trim tab indicated 30 percent tab down, which equated to 3 degrees nose up.

Neither propeller was found in the feathered position; the propeller governor controls on both engines were found spring-loaded to the high rpm stop. The left engine propeller exhibited chordwise scoring, leading edge damage, and s-bending. The right engine propeller exhibited

light chordwise abrasions, and both blades were bent aft.

Both engines were fire-damaged, with damage to the left engine more severe. Neither engine revealed any evidence of pre-accident mechanical malfunction.

MEDICAL AND PATHOLOGICAL INFORMATION

The PUI succumbed to his injuries on the day after the accident. An autopsy was performed by the Office of the Chief Medical Examiner, Commonwealth of Massachusetts, Boston Massachusetts. Toxicological testing was performed by the FAA Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma.

ADDITIONAL INFORMATION

The wreckage was released to a representative from Ryan Insurance Services, Inc., Biddeford, Maine.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	33,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	October 26, 1998
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	536 hours (Total, all aircraft), 84 hours (Total, this make and model), 102 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N98FM
Model/Series:	PA-34-200 PA-34-200	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	34-7350016
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	July 23, 1999 100 hour	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	IO-360
Registered Owner:	LAENEN AND PILGRIM INC.	**Rated Power:**	200 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PYM ,149 ft msl	**Distance from Accident Site:**	
Observation Time:	19:52 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	16°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	NORWOOD , MA (OWD)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	17:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	PLYMOUTH MUNICIPAL ARPT PYM	**Runway Surface Type:**	Asphalt
Airport Elevation:	149 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	6	**IFR Approach:**	None
Runway Length/Width:	4350 ft / 75 ft	**VFR Approach/Landing:**	Stop and go;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal, 1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Cox, Paul
Additional Participating Persons:	WILLIAM STEVENS; BEDFORD , MA MICHAEL MCCLURE; VERO BEACH , FL EDWARD R ROGALSKI; WILLIAMSPORT , PA RICHARD BUNKER; BOSTON , MA
Original Publish Date:	August 13, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=47271