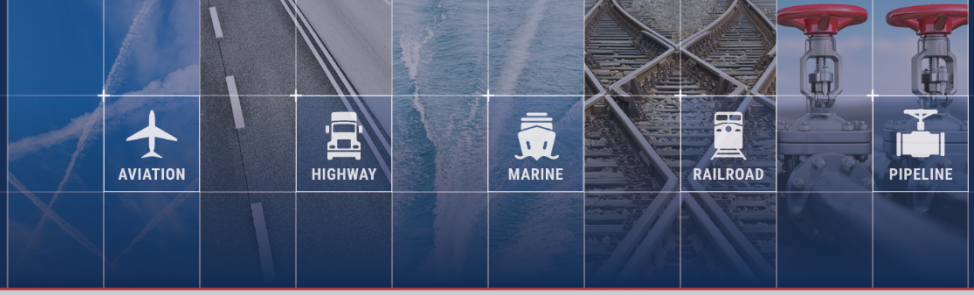

Aviation Investigation Final Report

Location:	Memphis, Tennessee	**Accident Number:**	ERA10LA082
Date & Time:	November 29, 2009, 16:15 Local	**Registration:**	N9243C
Aircraft:	Piper PA-32RT-300	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal, 3 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting an instrument landing system (ILS) approach, in instrument weather conditions, to his home airport after a 4 hour, 20 minute flight. According to air traffic control radar and voice data, the airplane maintained a parallel course, left of the runway centerline, for the entire approach, and when it was about 3 miles from the end of the runway, it descended below the glideslope. The air traffic controller issued two low altitude alerts over the next few minutes, after which the pilot acknowledged and initiated a climb. During the second climb, the ground speed decreased, and the pilot banked to the right and then sharply to the left. The groundspeed continued to decrease until the airplane stalled and impacted a grass area about 1 mile from the end of the runway. Witnesses reported the airplane appeared to be aligned with a parallel (center) runway, instead of the (left) runway the pilot was cleared for, when it descended from below the cloud layer.

The pilot, who was also a co-owner of the airplane, had a significant amount of total and instrument flight experience. He flew the accident airplane exclusively for the previous 11 years, and had conducted numerous instrument approaches at his home airport.

Weight and balance calculations revealed, at the time of the accident the airplane center of gravity was at about 99.26 inches aft of the airplane datum or approximately 3.26 inches aft of the rear center of gravity (CG) limit.

The pilot had a long history of significant liver disease (cirrhosis) as a result of chronic hepatitis C, and was apparently experiencing symptoms of insomnia and lethargy possibly

related to his liver disease. He was regularly prescribed (for sleep) an evening dose of a potentially impairing medication (clonazepam) typically contraindicated in significant liver disease and a daily dose of a wakefulness-promoting medication (modafanil). The pilot and his physician had omitted information regarding the pilot's known cirrhosis, symptoms, and use of medications in information submitted to the FAA. Evidence of actively worsening liver disease was noted on autopsy. It is possible that the pilot's judgment and/or performance were somewhat impaired by chronic effects of hepatitis C or by the effect of a sudden deterioration in his condition. It is also possible the pilot may have been impaired as a result of his use of a prescription medication for sleep, particularly given that the metabolism of that medication may have been adversely affected by his liver disease. An inactive marijuana metabolite was detected in the pilot's urine on post-mortem toxicological testing, suggesting only that the pilot had used marijuana sometime in the previous days or weeks.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to execute a timely missed approach and subsequent failure to maintain aircraft control, after he was unable to establish the airplane on the instrument approach. Contributing to the accident was the pilot's possible impairment due to his medical condition and/or medication use.

Findings

Aircraft	Airspeed - Not attained/maintained
Aircraft	Pitch control - Not attained/maintained
Aircraft	Directional control - Not attained/maintained
Personnel issues	Lack of action - Pilot
Personnel issues	Prescription medication - Pilot
Personnel issues	Illness/injury - Pilot

Factual Information

History of Flight

Approach-IFR final approach	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On November 29, 2009, at 1615 central standard time, a Piper PA-32RT-300, N9243C, was substantially damaged during landing at Memphis International Airport (MEM), Memphis, Tennessee. The certificated private pilot was fatally injured and three passengers received serious injuries. Instrument meteorological conditions prevailed and an instrument flight rules flight plan was filed for the flight which originated at the Greenbrier Valley Airport (LWB), Lewisburg, West Virginia, at 1255 eastern standard time. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

According to air traffic control radar data and recorded voice communications provided by the Federal Aviation Administration (FAA), the airplane entered Memphis Approach airspace at an altitude of 4,000 feet and was later cleared to 3,000 feet. The pilot was given an intercept heading and subsequently cleared for the ILS 18L approach at MEM. The airplane turned final at 3,000 feet and was subsequently cleared to 2,000 ft. Radar data indicated the airplane initially obtained the centerline for the 18L localizer; however, the airplane began to drift to the left soon after. The airplane maintained a parallel course, left of centerline, until glideslope interception.

When the airplane was about 5 miles from the end of runway 18L, it began a descent from 1,900 feet, while remaining left of the localizer. The airplane continued its descent until it reached an altitude of 900 ft (approximately 560 AGL), 3.6 nm from the end of runway 18L. At this point the airplane was below glideslope and left of centerline.

The air traffic controller issued a low altitude alert and current altimeter setting which was acknowledged by the pilot with "Roger, 43C, sorry about that." The airplane initiated a climb and turned toward the localizer, regaining it momentarily before drifting left again. The airplane climbed to 1,300 feet, then immediately descended again to 900 feet, when it was 2.6 nm from the end of runway 18L. A second low altitude alert (45 seconds after the first) was issued by the tower controller: "Low altitude alert, N43C, I show you indicating 1,000 feet, altimeter setting 29.92." The pilot responded "Roger, ah, 29." No further transmissions were received from the airplane.

Radar data indicated the airplane then climbed to 1,200 feet, during which the ground speed decreased from 95 knots to 83 knots. The airplane then began a right descending turn toward

the southwest (186 degrees to 243 degrees), while the ground speed continued to decrease to 74 knots while in the turn. The airplane briefly became established on a level heading before making a left turn to 158 degrees. The ground speed decreased further to 63 knots, at an altitude of 500 feet.

The last radar hit indicated a heading of 158 degrees, at an altitude of 200 feet, and an airspeed of 63 knots.

The airplane impacted the grass area 10-degrees right (west) of the centerline and 1.25 nm from the end of runway 18L.

A witness, who was an instrument-rated pilot, reported he observed the airplane "emerge from the low lying clouds and thought it was obviously going to land well short of the runway." He observed the airplane at an altitude of about 400 feet, "on approach to 18C." The witness reported the airplane was headed in a southeast direction, instead of "directly south." The witness then observed the airplane bank to the left, enter a rapid descent, and subsequently "correct to the right" before impact. He thought the airplane "appeared to stall" just prior to striking the ground.

Another witness, who was working on the airport ramp, saw the airplane "flying very slow and tipping its wings from side to side" prior to the impact. After the impact, one of the passengers reported to the witness that the airplane was "hit with windshear from the right side" during the approach.

A third witness observed the airplane "depart from the low cloud cover and was already at a steep angle to the left." The witness stated the airplane "was vertical, with the left wing tip straight down." The airplane then "appeared to lose all lift and fell straight down, like a paper plane." The airplane first struck the ground with the left wing, which broke off, initiating a small fire.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent third-class FAA medical certificate was issued on December 18, 2007. At that time he reported 1,700 hours of total flight experience.

A review of the pilot's FAA Airman File revealed the pilot received a disapproval for his first application for an instrument rating, on April 1, 2000. The areas included for reexamination were: air traffic control clearances and procedures and holding procedures. The pilot successfully completed the practical examination for his instrument rating on May 8, 2000.

Two pilot logbooks were located in the airplane after the accident. The first logbook contained entries from January 7, 1997 to July 12, 2006. The second logbook contained entries from July 12, 2006 to November 29, 2009. According to the logbooks, the pilot accumulated 1,459 hours

of total flight experience. He accumulated 273 hours of actual instrument experience, 6 hours of which were accumulated during the previous 6 months. In the previous 90 days, the pilot accumulated 9 hours of total flight experience, and in the previous 30 days the pilot accumulated 5 hours of total flight experience.

Additional review of the logbooks revealed the pilot began flying the accident airplane in July 1999. All of his flight time documented in the second logbook (from July 2006 to November 2009) was accumulated in the accident airplane. Additionally, all of the flights either departed from or returned to MEM, where the airplane was based, and a number of instrument approaches were conducted to MEM.

The pilot's most recent instrument proficiency check was completed on August 22, 2009. He also completed a biennial flight review on the same date. According to the certified flight instructor (CFI) who administered the reviews, 3 flights and 3 ground training sessions were needed to complete the reviews. The flight time totaled 4.7 hours and the ground training totaled 4.5 hours. The CFI assessed the pilot's skill and knowledge levels as "average," and reported the pilot flew "decent ILS approaches."

AIRCRAFT INFORMATION

The Piper PA-32RT-300 was a single-engine airplane powered by a Lycoming IO-540, 300 horsepower engine.

The pilot was also a co-owner of the airplane. He purchased the airplane in October 1999, with two other individuals. The airplane had been based at MEM since it was purchased.

The most recent inspection performed on the airplane was an annual inspection, completed on October 1, 2009. At that time, the airplane had accumulated 4,850 total flight hours.

At the time of the accident, the airplane had accumulated 4,875 total flight hours.

The airplane was last re-fueled prior to departure from LWB. According to an employee of the fixed base operator at LWB, the airplane was "topped off" with 44 gallons of aviation fuel.

A weight and balance computation was completed by a representative of the airplane manufacturer. According to the computation, at the time of the accident the airplane center of gravity was at about 99.26 inches aft of the airplane datum or approximately 3.26 inches aft of the rear center of gravity (CG) limit.

Additionally, assuming the passenger seating configuration provided by one of the passengers, the departure weight would have been about 143 pounds over the airplane's maximum gross weight and the CG would have been a fraction of an inch out of the aft limit.

METEOROLOGICAL INFORMATION

Weather recorded at MEM, at 1553, included wind from 190 degrees at 10 knots, 1 mile visibility in mist, an overcast cloud layer at 300 feet, temperature 13 degrees C, dew point 12 degrees C, and altimeter setting 29.91 inches mercury.

Weather recorded at 1632, included wind from 200 degrees at 8 knots, 1 mile visibility in mist, an overcast cloud layer at 300 feet, temperature 13 degrees Celsius (C), dew point 12 degrees C, and altimeter setting 29.92 inches mercury.

The pilot requested and received a weather briefing for the flight, from the Raleigh Flight Service Station (FSS) on November 29, 2009 at 1121 EST. The weather briefer informed the pilot that his flight may "be longer than expected" due to "some weather" in western Tennessee. A trough extended from northern Virginia to northern Georgia, and a low pressure system and cold front existed behind the trough, which created the adverse weather. The terminal forecast for the Memphis area at the time of the pilot's arrival included winds from 200 degrees at 9 knots, visibilities greater than 6 miles with rain showers in the vicinity and an overcast cloud layer at 1,500 feet.

At the conclusion of the briefing, the pilot filed his IFR flight plan. He did not list an alternate airport for his destination.

AIRPORT INFORMATION

Memphis International Airport was comprised of three parallel runways, oriented in a 18R/36L, 18C/36C, and 18L/36R configuration. The airport also had an intersecting runway, oriented in a 9/27 configuration.

The airport had 27 approaches to the 8 runways.

The inbound course for the ILS Runway 18L approach was 178 degrees magnetic, and the glideslope crossing altitude was 2,000 feet. The decision altitude (DA) was 501 feet msl and the touchdown zone elevation was 301 feet. The visibility requirement for the approach was 1/2 mile. The approach procedure required the pilot to acquire visual contact with the runway upon reaching the DA. If the approach was not stabilized, and/or no visual contact was made at the DA, the pilot was required to perform the missed approach procedure, which was: "climb to 900 then climbing left turn to 5,000 via MEM VORTAC R-151 to KEEZE Int/MEM 10.4 DME and hold, continue climb-in-hold to 5,000."

The ILS Runway 18L approach was equipped with a medium intensity approach lighting system with runway alignment indicator lights (MALSR), as well as a 4-light precision approach path indicator (PAPI) on the left side of the runway.

WRECKAGE AND IMPACT INFORMATION

Examination of the airplane and the accident site, by an FAA inspector, revealed the airplane initially impacted a grass area north of runway 18C. It then skid across the grass, and impacted a concrete barrier before coming to rest. The wreckage path was less than 100 yards in length, and located along the path was the right flap and left landing gear. The airplane came to rest upright, with the left wing separated from the fuselage and resting on top of the right wing. The right wing and tail section remained attached to the fuselage, which sustained severe post-crash fire damage. The throttle, propeller, and mixture control levers were about 1 inch from the full forward position. Flight control continuity was confirmed from the cockpit area to the flight controls or fuselage breaks.

The airplane was transported to a secure salvage facility and further examined by representatives from Piper Aircraft and Lycoming Engines, under the supervision of an NTSB investigator. The examination revealed the left wing was separated from the fuselage at the wing root. The left wing assembly was mostly intact with the aileron in position. The left flap was separated and found at the crash site along the debris trail. Both the aileron control and aileron balance cables were separated at the wing root and displayed "broomstraw" features.

The left wing displayed substantial impact and fire damage extended from the leading edge aft to the main spar. The fuel tank was breached.

The right wing remained secured to the fuselage and was removed to facilitate transport. The wing displayed substantial fire and impact damage, and the fuel tank had been breached. The flap and aileron were secured to the wing. The aileron control and balance cables were secured to the bellcrank and cut for transport.

The left and right landing gear were separated and their actuators were extended, consistent with the gear being extended at the time of separation.

The position of the torque tube flap arms in both wings were consistent with a retracted flap position.

The vertical stabilizer and rudder were in place and secure. Both rudder cables were secured to the rudder sector and continuous to the rudder pedals. The horizontal stabilator was in place and displayed impact damage to the right side leading edge. The control linkage was secured to the stabilator balance tube and continuous to the control wheel T bar assembly.

The fuselage incurred substantial impact and thermal damage but was mostly intact. The center of the fuselage was bent upward and the roof had partially collapsed down to the top of the center seats.

The airplane was equipped with an Altimatic IIIB autopilot system. The mode switch was in the "HDG" (heading) position and the heading bug on the directional gyro was set to 190 degrees and the needle was positioned on about 172 degrees. The roll switch was positioned on the full right position. Both the autopilot engage and the HDG engage switches were electrically

held when engaged.

The attitude gyro was removed for examination. The case was in good condition and displayed no damage. The internal examination found the gimbaled assembly free to move through the full range of motion with no restriction. Disassembly of the housing found no internal rotational damage, scoring, or restriction to rotation.

The engine, propeller and firewall remained attached to the fuselage. All three propeller blades sustained leading edge gouging and chord-wise scratching. The blades were all bent opposite the direction of rotation. The engine was rotated by hand from the propeller, and thumb suction and compression were obtained on all cylinders. Valve train continuity was observed through the camshaft to the rocker arms and valves. The cylinders were inspected using a lighted boroscope and no anomalies were noted. The dual-single drive magneto was removed from its mount and rotated using a drill motor. All outlet points furnished spark. The spark plugs were examined, and displayed a color consistent with normal combustion when compared to the Champion Spark Plug Wear Guide. The vacuum pump was removed from its mount and disassembled; no anomalies were noted. It was then reassembled and rotated by hand, furnishing suction and exhaust.

MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Shelby County Medical Examiner performed an autopsy on the pilot on November 30, 2009. The cause of death was listed as multiple blunt force injuries.

The Federal Aviation Administration (FAA) Bioaeronautical Research Laboratory, Oklahoma City, Oklahoma, conducted toxicological testing on the pilot. The following drugs were noted during the pilot's toxicological testing:

0.152 (ug/mL, ug/g) 7-Amino-clonazepam detected in Urine
0.022 (ug/mL, ug/g) 7-Amino-clonazepam detected in Blood
0.0126 (ug/mL, ug/g) Tetrahydrocannabinol (Marihuana) detected in Lung
Tetrahydrocannabinol (Marihuana) NOT detected in Blood
0.0119 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (Marihuana) detected in Urine
0.0028 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (Marihuana) detected in Kidney
Tetrahydrocannabinol Carboxylic Acid (Marihuana) NOT detected in Blood

The NTSB Medical Officer reviewed the medical records maintained by the FAA Aerospace Medical Certification Division, as well as records kept by the pilot's pharmacy and his physician. The following information was extracted from those records:

The pilot's FAA medical records documented a history of chronic active hepatitis C identified since at least 1997 with failure of multiple treatments, annual letters from 2005 until December 5, 2008 from the pilot's gastroenterologist documenting that the pilot was doing well and not taking any medications, and Authorizations for Special Issuance of Medical Certificate most

recently issued for a 6 year period beginning 2005. A letter dated March 9, 2009 to the pilot from the Manager of the FAA Aerospace Medical Certification Division noted, in part, "Our review of your medical records has established that you are eligible for a third-class medical certificate. Your Authorization for Special Issuance in no longer necessary. Therefore, no further follow up reports will be required unless you experience adverse changes in your medical status. ... Because of your history of Hepatitis C, operation of airplane is prohibited at any time new symptoms or adverse changes occur or any time medication and/or treatment is required. ..." The pilot's application for airman medical certificate on December 4, 2006 and his most recent application on December 18, 2007 each noted "No" in response to "Do You Currently Use Any Medication." Personal records from the pilot's gastroenterologist noted a stage 4 liver biopsy in 2000, the use of clonazepam 1mg at bedtime as needed for sleep since at least October 2006 and of modafanil 200mg once or twice a day since at least June 2008, and symptoms of lethargy noted in January 2009. There was no information in the FAA medical records regarding the pilot's liver biopsy.

The autopsy report on the pilot included the following description of the examination of his liver: "The liver weighs 2120 grams. The liver capsule is intact and finely nodular. Sectioning the liver reveals pink-brown, firm tissue with a nodular consistency. These nodules measure from 2 to 3 mm in diameter. The gall bladder contains liquid bile." Microscopic examination of the liver was described as: "Mild fatty change and micronodular cirrhosis. The fibrous bands contain a mixed inflammatory infiltrate. Necrotic hepatocytes are identified."

ADDITIONAL INFORMATION

Two of the passengers in the airplane were children of the pilot. They declined to provide a statement during the investigation. The third passenger was a friend of the children's. He reported that he had no memory of the accident.

Pilot Information

Certificate:	Private	**Age:**	57,Male
Airplane Rating(s):	Single-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 3 With waivers/limitations	**Last FAA Medical Exam:**	December 18, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 22, 2009
Flight Time:	1459 hours (Total, all aircraft), 1350 hours (Pilot In Command, all aircraft), 9 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N9243C
Model/Series:	PA-32RT-300	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-7885039
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	October 1, 2009 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	25 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4875 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:		**Engine Model/Series:**	IO-540 SER
Registered Owner:	EMMETT ORYAN	**Rated Power:**	300 Horsepower
Operator:	EMMETT ORYAN	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	MEM,341 ft msl	**Distance from Accident Site:**	
Observation Time:	15:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:		**Visibility**	1 miles
Lowest Ceiling:	Overcast / 300 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.9 inches Hg	**Temperature/Dew Point:**	13°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lewisburg, WV (LWB)	**Type of Flight Plan Filed:**	IFR
Destination:	Memphis, TN (MEM)	**Type of Clearance:**	IFR
Departure Time:	12:55 Local	**Type of Airspace:**	

Airport Information

Airport:	Memphis International Airport MEM	**Runway Surface Type:**	Asphalt
Airport Elevation:	341 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	18L	**IFR Approach:**	ILS
Runway Length/Width:	9000 ft / 150 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 Serious	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 3 Serious	**Latitude, Longitude:**	35.042499,-89.976669(est)

Administrative Information

Investigator In Charge (IIC):	Andrews, Jill
Additional Participating Persons:	Angela Langston; FAA/FSDO; Memphis, TN Mike McClure; Piper Aircraft; Duncanville, TX John Butler; Lycoming Engines; Arlington, TX
Original Publish Date:	September 19, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=75106