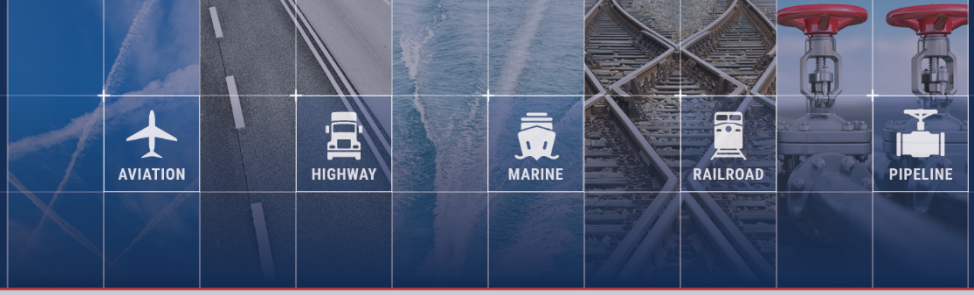

Aviation Investigation Final Report

Location:	Amarillo, Texas	**Accident Number:**	CEN14FA047
Date & Time:	November 11, 2013, 00:56 Local	**Registration:**	N4245D
Aircraft:	BEECHCRAFT B36TC	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The noninstrument-rated private pilot filed an instrument flight plan to an airport that was reporting night instrument meteorological conditions (IMC), which included ¼-mile visibility, fog, sky obscuration, and 100-foot vertical visibility. Radar track data showed that, upon arrival at the airport, the pilot flew the instrument lighting system approach and then attempted to execute a missed approach. During the missed approach, radar contact was lost and the airplane impacted the terrain. The postaccident examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

The pilot's toxicology report indicated that gabapentin and duloxetine were found in the pilot's system, and both are disqualifying drugs for flight. The pilot did not report either of these disqualifying medications on his last medical certification examination. While both medications are sedating, a witness reported that the pilot was alert and energetic before the flight and showed no signs of sedation. Witness reports and findings from the wreckage examination are consistent with a loss of control event, and, based on the degraded visual reference conditions present about the time of the accident, it is likely that the pilot experienced spatial disorientation. Although it could not be determined what effect the use of the medications had on the pilot's performance during the high-workload IMC flight, their use could increase the chance of experiencing and responding inappropriately to spatial disorientation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The noninstrument-rated pilot's improper decision to fly a night instrument approach in instrument meteorological conditions, which resulted in the pilot's spatial disorientation and loss of control of the airplane during an attempted missed approach.

Findings

Personnel issues	Decision making/judgment - Pilot
Personnel issues	Total instrument experience - Pilot
Personnel issues	Spatial disorientation - Pilot
Aircraft	(general) - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	Dark - Effect on personnel
Environmental issues	Low visibility - Effect on personnel
Environmental issues	Fog - Effect on personnel

Factual Information

History of Flight

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

On November 11, 2013, about 0056 central standard time (cst), a Beechcraft B36TC, N4245D, was destroyed when it impacted the terrain about 2 nautical miles northeast of the Rick Husband Amarillo International Airport (AMA), Amarillo, Texas, during a missed approach. The private pilot and two passengers received fatal injuries. The airplane was registered and operated by the pilot under the provisions of the 14 Code of Federal Regulations as a Part 91 personal flight. Night instrument meteorological conditions (IMC) prevailed at the time of the accident, and an instrument flight rules (IFR) flight plan was filed. The airplane departed from the Lubbock Preston Smith International Airport (LBB) about 2347 on November 10, 2013.

Air traffic control radar and communications data indicated that the pilot flew three previous flights on Sunday, November 10, 2013, before the accident flight. The first flight departed Tradewind Airport (TDW), Amarillo, Texas, about 1424 and landed at LBB about 1502. The second flight departed LBB about 1536 and landed at the Collin County Regional Airport (TKI), Dallas, Texas, about 1716. The third flight departed TKI about 2123 and landed at LBB about 2317. The accident flight departed LBB about 2347 with TDW as the intended destination. IFR flight plans were filed for all four flights.

Radar track data indicated that during the flight to TDW, the airplane entered a north/south holding pattern and flew two turns in holding as published at the ZERAR waypoint. About 0032, the Albuquerque Air Route Traffic Control Center (ARTCC) cleared the flight for the area navigation (RNAV) Runway 35 approach to TDW. The radar track data showed that the pilot flew the approach; and subsequently, the pilot executed the published missed approach at TDW. About 0039, the pilot contacted ARTCC and reported that he executed the missed approach at TDW due to fog. The flight proceeded back to the ZERAR way point in accordance with the missed approach procedure.

At 0048, ARTCC cleared the flight for the instrument landing system (ILS) Runway 4 approach into AMA, which was about 6 nm from TDW, with an alternate landing airport at the Hale County Airport (PVW), Plainview, Texas, if the instrument approach was unsuccessful. The pilot acknowledged the clearance and no further radio transmissions were made by the pilot. The radar track data indicated the pilot flew the ILS Runway 4 approach to AMA; and then attempted to execute the missed approach. During the missed approach, the airplane departed radar contact and impacted the terrain.

Pilot Information

Certificate:	Private	**Age:**	48
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	October 23, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 410 hours (Total, all aircraft), 25 hours (Total, this make and model), 2 hours (Last 24 hours, all aircraft)		

The 48-year-old private pilot held a single-engine airplane land rating which he received on July 16, 1985. He held a third class medical certificate issued on October 24, 2013. During his medical examination, the pilot reported that his total flight time was 410 hours. There was no Federal Aviation Administration (FAA) record of an instrument rating being issued to the pilot.

On October 24, 2014, the pilot took the FAA instrument knowledge test that is required to get an instrument rating. However, he received a score of 68 percent on the test, and a passing score is 70 percent. The pilot intended to fly the instrument check ride, but was unable to take the instrument check ride until he passed the instrument knowledge test.

The pilot purchased the accident airplane on October 30, 2013, in Greensboro, North Carolina. The airplane broker who sold the pilot the airplane reported that the pilot intended to have his instrument rating completed prior to purchasing the airplane. The pilot received two days of initial Bonanza training after he purchased the airplane. The initial training consisted of 4 hours of ground instruction followed by 10.5 hours of flight instruction. The flight instructor reported that the pilot had about 400 to 600 hours of flight time in a Cessna 172RG. The pilot did not have any experience with the flight director, autopilot, or the Garmin Nav/Coms. The flight instructor reported they practiced basic air work which included takeoff and landings, stalls, steep turns, unusual attitudes, and emergency procedures. About 2.5 hours of flight time was flown in IMC conditions in which they practiced using the autopilot and flight director, programing the Garmin for instrument approaches, and hand flying in IMC conditions. As a result of the initial Bonanza training, the pilot received a high performance endorsement and a complex airplane endorsement.

Although the accident pilot was checked out in the airplane, he hired another experienced Bonanza pilot to assist him in ferrying the airplane back to Texas. They flew about 15 hours in the next three days. The first day of flying was primarily practicing takeoff and landings. On the two flights en route to Texas, IFR flight plans were filed even though the weather was visual meteorological conditions. The accident pilot did all the flying and they did not fly any instrument approaches. The experienced Bonanza pilot reported that the accident pilot did not have any problems flying the airplane and he did not exhibit any unsafe tendencies.

Aircraft and Owner/Operator Information

Aircraft Make:	BEECHCRAFT	**Registration:**	N4245D
Model/Series:	B36TC	**Aircraft Category:**	Airplane
Year of Manufacture:	1999	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	EA-645
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	September 24, 2013 Annual	**Certified Max Gross Wt.:**	3850 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1439 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-550-B
Registered Owner:	William M. Capt	**Rated Power:**	300 Horsepower
Operator:	William M. Capt	**Operating Certificate(s) Held:**	None

The airplane was a Beechcraft B36TC, serial number EA-645, manufactured in 1999. The airplane had a maximum gross weight of 3,850 pounds was configured to seat six occupants. The engine was a Continental IO-520-B2 engine, which was converted to a 300-horsepower IO-550-B (AP) via Supplemental Type Certificate (STC) #SE02881AT on April 10, 2009. The last annual maintenance inspection was conducted on September 24, 2013. The airplane had accumulated a total time of 1,438.9 hours, and the engine had accumulated 319.3 hours since overhaul at the time of the inspection.

The two passengers who flew in the airplane from Dallas to Lubbock on November 10, 2013, reported that the airplane flew fine, all the instruments were in the "green," and that it was a very normal flight.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	AMA,3607 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	00:58 Local	**Direction from Accident Site:**	60°
Lowest Cloud Condition:		**Visibility**	0 miles
Lowest Ceiling:	Indefinite (V V) / 200 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.22 inches Hg	**Temperature/Dew Point:**	9°C / 8°C
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	Lubbock, TX (LBB)	**Type of Flight Plan Filed:**	IFR
Destination:	Amarillo, TX (AMA)	**Type of Clearance:**	IFR
Departure Time:	23:27 Local	**Type of Airspace:**	

At 2353 on November 10, 2013, the surface weather observation at AMA was: wind 170 degrees at 13 knots; 1/4 mile visibility; fog; sky obscured; vertical visibility 100 feet; temperature 8 degrees Celsius (C); dew point 8 degrees C; altimeter 30.24 inches of mercury.

At 0053 on November 11, 2013, the surface weather observation at AMA was: wind 170 degrees at 10 knots; 1/4 mile visibility; fog; sky obscured; vertical visibility 100 feet; temperature 9 degrees C; dew point 8 degrees C; altimeter 30.23 inches of mercury.

At 1943 on November 10, 2013, the National Weather Service office in Amarillo, Texas, issued a dense fog advisory for much of the Texas Panhandle. This advisory warned of the low visibility conditions throughout the Panhandle because of dense fog, and that the dense fog conditions were expected to persist through 0900.

During the approach to TDW, the air traffic controller provided the pilot with the current weather at AMA since there was no weather reporting at TDW. The current weather at AMA was wind 170 degrees at 13 knots; visibility 1/4 mile with fog obscuration and ceiling variable between 1,400 feet and 1,600 feet.

A witness, who was a Texas State Trooper, reported that at 2230 she was completing an investigation of a vehicle accident located about 3 miles from site of the airplane accident that occurred about 2.5 hours later. She reported that there was heavy ground fog in the area with horizontal visibility limited to about 50 feet.

Airport Information

Airport:	Amarillo International Airport AMA	**Runway Surface Type:**	Concrete
Airport Elevation:	3607 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	04	**IFR Approach:**	ILS
Runway Length/Width:	13502 ft / 200 ft	**VFR Approach/Landing:**	Go around

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	35.250556,-101.675834

The airplane impacted a flat, clay dirt pasture on a magnetic heading of about 276 degrees. The debris path was about 1,000 feet long and 175 feet wide. The engine traveled the furthest from the initial impact point. The initial impact ground scar measured about 60 feet long. A green lens piece was found at the initial ground scar. About 60 feet from the initial impact point , a ground scar about 10 feet long was observed with the right elevator balance weight horn protruding into the ground at about an 85 degrees down angle. A burn area about 150 feet by 28 feet extended from the second ground scar. The right wing was fragmented, and pieces of the right wing were found in the debris path from the initial ground scar to where the main wreckage was located about 600 feet from the initial impact point. The propeller was separated from the engine and was found along a barb wire fence about 550 feet from the initial ground scar.

The main wreckage consisted of the cabin aft of the engine firewall, the left wing, the aft baggage compartment, and the empennage, which was found inverted. A ground fire consumed a majority of the fuselage and cockpit instruments, and the left wing exhibited fire damage. The structure around the power quadrant was consumed by fire. The airspeed indicator was located in the debris field, and the pointer was found stuck at 156 knots.

All primary flight control surfaces and flaps were located at the wreckage site. Flight control continuity of all primary flight control cables was confirmed from the cockpit to their respective flight control surfaces, with the cable separations exhibiting signatures consistent with overload. Continuity of the aileron, elevator, and rudder trim control cables was confirmed from the cockpit to the respective flight control trim surfaces, with the cable separations exhibiting signatures consistent with overload. The left flap remained attached to the left wing and was found in the up position. The right flap separated from the fragmented right wing, and the flap actuator extension corresponded to a 5 degree flap down position.

The engine came to rest inverted in a field approximately 1,000 feet from the initial point of impact. The

intake and exhaust components were not attached to the engine and were found scattered among the debris field. All of the fuel system components were separated from the engine with the exception of the fuel manifold, injector lines, and nozzles. The magnetos, alternator, engine-driven vacuum pump, starter motor/starter adapter, turbocharger, pressure controller, overboost relief valve, wastegate actuator, intercooler, oil pump, oil cooler, oil filter, and oil sump were all separated from the engine, and all but the starter motor and adapter were identified throughout the debris field.

Portions of the lower crankcase halves and the accessory end of both halves were separated from the engine and were located throughout the debris field. The crankshaft, camshaft, and idler gears, as well as the propeller drive and propeller bevel gears, were visible. There was no sign of operational distress, oil starvation, or discoloration on any of the visible internal components. The sparkplugs displayed normal wear and combustion deposits. The cylinders were examined using a lighted borescope, and no internal anomalies were noted with the cylinder barrels, pistons, valves, or valve seats.

The propeller was separated from the propeller flange. The examination of the 3-blade propeller revealed that all three blades remained attached to the propeller hub. All three blades displayed heavy polishing near the blade tips. The blade labeled A during the on-site examination was loose in the hub and was rotated approximately 140° within the hub. Blade A also exhibited leading edge gouges and deep, chord-wise scrapes. The blade labeled B was twisted toward low pitch toward the tip. Blade C sustained S-bending damage and twisting toward low pitch toward the tip, and the outboard eight inches of blade tip was separated from the blade. The mounting side of the propeller hub displayed numerous gouges, and the mounting bolt holes were elongated and distorted.

Medical and Pathological Information

An autopsy of the pilot was performed at the Potter County Coroner's Office in Lubbock, Texas, on November 12, 2013. The "Cause of Death" was listed as multiple blunt force injuries of the head, neck, and torso due to an aircraft mishap. A Forensic Toxicology Fatal Accident Report was prepared by the FAA Civil Aerospace Medical Institute. The results were negative for ethanol. The test for cyanide was not performed. There was an insufficient specimen for carbon monoxide testing. The following substances were identified in the toxicology report: 22 (ug/ml, ug/g) acetaminophen detected in the urine, duloxetine detected in the urine, duloxetine detected in the liver, gabapentin detected in the urine, gabapentin detected in the blood (cavity), and ibuprofen detected in the urine.

Acetaminophen is an analgesic marketed under the brand name Tylenol. It is available over the counter and by prescription in a number of combination medications. Ibuprofen is used for the management of mild to moderate pain, fever, and inflammation. Gabapentin may be used to treat nerve pain conditions. Duloxetine may be used to treat muscle pain and stiffness and chronic (long-lasting) pain that are related to muscles and bones.

Gabapentin and duloxetine are both disqualifying drugs for flight. The pilot did not report either of these disqualifying medications on his last medical certification examination on October 24, 2013.

The pilot's daughter reported that he had broken his leg in December of 2011, and had severe nerve pain

as a result which required him to take pain medications. She stated that the pilot was very alert and energetic during the flight from Dallas to Lubbock on November 10, 2013, and showed no signs of sedation.

Tests and Research

The NTSB Materials laboratory examined the right wing aileron cable fracture using at optical stereomicroscope. No evidence of preexisting damage was observed.

The J. P. Instruments (JPI) EDM 730/830 panel mounted engine monitor that can record up to 24 parameters related to engine operations was sent to the National Transportation Safety Board's (NTSB) Vehicle Recorder Division for examination. The JPI EDM-730's chip containing the non-volatile memory was removed from the internal circuit board and the data was downloaded. The EDM recording contained 121 recorded flight logs. The accident flight log was located from the data recorded on November 11, 2013, and it contained about 753 valid points of data over a span of about 75 minutes. The internal clock in the unit was set to coordinated universal time (UTC); however, the time recorded indicated that the internal clock was about 6 minutes "ahead" of UTC when compared to other sources.

The EDM recorded data from the accident flight indicated that the engine start occurred at 23:46:30 cst (UTC time with the 6 hour offset. All times in cst) and it continued to record data until 01:01:42, when the unit was powered off. At 23:54:36, the fuel flow increased to about 35 gallons per hour (gph) with a correlated increase in rpm to about 2,700 rpm, which was consistent with takeoff power. About 12 minutes later, the fuel flow was reduced to about 17 gph and there was a correlated decrease in rpm to about 2,500 rpm. About 37 minutes later, the fuel flow increased to about 37 gph with a correlated increase in rpm to about 2,700 rpm, which lasted for about 4.5 minutes. Then the fuel flow and rpm were again reduced for about 11.5 minutes. At 00:59:48, the fuel flow rapidly increased to about 37 gph with a correlated increase in rpm to about 2,700 rpm for a third time during the flight. It maintained this value until the end of the recording at 01:01:42.

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Gordon D Morris; FAA Lubbock FSDO; Lubbock, TX Earnest Hall; Beechcraft; Wichita, KS Nicole Charnon; Continental Motors; Mobile, AL
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