



# Aviation Investigation Final Report

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<b>Location:</b>	Crystal Lake, Illinois	<b>Accident Number:</b>	CEN12FA083
<b>Date &amp; Time:</b>	November 26, 2011, 10:26 Local	<b>Registration:</b>	N223CD
<b>Aircraft:</b>	CIRRUS DESIGN CORP SR20	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	4 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

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## Analysis

The noninstrument-rated pilot was conducting the accident flight under visual flight rules (VFR) without a flight plan. The pilot contacted the tower air traffic controller at the intended destination airport and inquired about landing. The controller informed him that the airport was currently under instrument flight rules (IFR). About 30 seconds later, the pilot informed the controller that he had inadvertently flown over the airport. The controller ultimately cleared the flight to land; however, the pilot decided not to land, informing the controller that he did not want to get delayed at the airport due to the weather. The pilot subsequently told the controller that the flight was “in and out of the clouds.” After asking the pilot if he was IFR qualified (and learning that the pilot was not), the controller transferred the flight to the local radar-equipped approach control facility for further assistance. That controller advised the pilot of several airports in the vicinity that were under VFR. After initially indicating that he would divert to one of those airports, the pilot told the controller that he did not want to “mess with the weather” and did not want to “get stuck in here,” and he declined to proceed to that airport. Radar data depicted that, shortly after the pilot’s radio transmission, the airplane entered a gentle right turn. About 90 seconds later, the right turn tightened abruptly, consistent with the airplane entering a steep spiral. The last 19 seconds of radar data depicted the airplane entering a climb of about 2,500 feet per minute (fpm) followed by an approximate 3,600-fpm descent. Witnesses reported hearing an airplane overhead, but they were not able to see it due to the cloud cover. They described the sound as similar to an airplane performing aerobatics. The witnesses subsequently observed the airplane below the clouds in a steep, nose-down attitude before it struck the ground. Based on reported weather conditions in the vicinity of the accident site, the flight encountered instrument meteorological conditions. A postaccident examination of the airplane did not reveal any anomalies consistent with a preimpact failure or malfunction.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The noninstrument-rated pilot's decision to continue flight in instrument meteorological conditions, which resulted in the pilot's spatial disorientation and loss of control of the airplane.

### Findings

<b>Personnel issues</b>	Decision making/judgment - Pilot
<b>Personnel issues</b>	Spatial disorientation - Pilot
<b>Personnel issues</b>	Aircraft control - Pilot
<b>Environmental issues</b>	Below VFR minima - Effect on operation

## Factual Information

### History of Flight

<b>Enroute</b>	VFR encounter with IMC
<b>Enroute</b>	Loss of control in flight (Defining event)
<b>Uncontrolled descent</b>	Collision with terr/obj (non-CFIT)

#### HISTORY OF FLIGHT

On November 26, 2011, at 1026 central standard time, a Cirrus Design SR20, N223CD, was substantially damaged when it collided with a tree and terrain near Crystal Lake, Illinois. The private pilot and three passengers were fatally injured. The aircraft was registered to Marion Pilots Club and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91, without a flight plan. Instrument meteorological conditions prevailed in the vicinity of the accident site. The personal flight originated from Marion Regional Airport (MZZ), Marion, Indiana about 0830. The intended destination was DuPage Airport (DPA), West Chicago, Illinois.

The line service representative at MZZ reported that the airplane was fully fueled prior to departure. The pilot informed him that they were going to Chicago. When asked, the pilot commented that he was aware of the weather west of Chicago and that conditions were forecast to be visual flight rules (VFR) at their estimated time of arrival.

Radar track data depicted the airplane on a 1200 (VFR) transponder code approaching DPA from the southeast. At 0942, the airplane was located approximately 3 miles east of the Chicago Heights VHF Omni Range (VOR) navigation facility at 2,400 feet mean sea level (msl). The airplane maintained a northwest course at 2,400 feet msl until about 0957. About that time, the airplane turned right and became established on a north course. The aircraft was located about 5 miles south of DPA, approximately 1,600 feet msl, at that time.

At 0958:05 (hhmm:ss), the pilot contacted DPA Air Traffic Control Tower (ATCT) and inquired about landing at DPA. Radar data indicated that the airplane was approximately 2 miles south of the airport at that time. The controller advised the pilot that the airport was under instrument flight rules (IFR). About 30 seconds later the pilot informed the controller that he had inadvertently flown over the airport. At 0959:40, the controller authorized the pilot to reverse course and land at DPA. The pilot acknowledged this transmission. About 1000, radar data indicated that the aircraft began a turn to an east course. At 1002, the pilot informed the controller that he no longer had the airport in sight. The controller provided a suggested heading to DPA.

At 1004, the pilot asked if there was another airport with better visibility because he did not "want to get in there and get stuck all day." The controller noted that Chicago Executive Airport

(PWK), located about 20 miles northeast of DPA, was reporting VFR conditions. The controller asked if the pilot would like to be transferred to Chicago approach for assistance navigating to PWK. The pilot replied, "I'm still trying to decide if I want to try to land at DuPage or not . . . would you think that's a good idea or not." The pilot subsequently informed the controller that the flight was "in and out of the clouds." When the controller asked the pilot if he was instrument flight rules (IFR) qualified, the pilot replied that he was in "IFR training and I've let this get around me." At 1008, the DPA controller provided the pilot with a frequency for Chicago Terminal Radar Approach Control (TRACON).

At 1012:39, Chicago TRACON initiated contact with the pilot. The controller subsequently provided weather conditions at airports in the vicinity of the accident flight. At 1015:28, the pilot advised the controller that he would proceed to PWK. However, at 1022:49, the pilot advised the controller that he did not "want to mess with the weather . . . I'm gonna get out . . . and I don't want to get stuck in here." The pilot confirmed that the flight was no longer inbound to PWK. At that time, the flight was approximately 2.5 miles west-northwest of Lake in the Hills Airport (3CK). The controller subsequently transmitted, "frequency change is approved." The pilot acknowledged that transmission at 1024:23. No further communications were received from the accident flight.

At 1021, the airplane was established on a north course at approximately 1,800 feet msl. About 1023:03, the airplane entered a left turn to momentarily become established on a west course. About 1024:03, the airplane entered a right turn from the west course at 1,800 feet msl. The right turn continued until the final radar data point. About 1025:08, the airplane was established on an approximate east course at 2,000 feet msl. At 1025:31, the airplane was on an approximate southeast course at 2,400 feet msl, and 18 seconds later, the airplane was on a south course about 2,100 feet msl. At this point, the right turn appeared to tighten. At 1025:58, the airplane was established on a west course about 1,800 feet msl. The final radar data point was recorded at 1026:22. The airplane appeared to be on a south course about 1,800 feet msl. The final data point was located approximately 0.4 miles northwest of the accident site.

A witness located within 1/2 mile of the accident site reported hearing an airplane in the area; however, he was not able to see it because of the cloud cover. He noted that it sounded like the airplane was doing aerobatics, with the airplane climbing and descending. Less than 1 minute later, he observed the airplane south of his position in an approximate 70-degree nose down attitude. The airplane subsequently impacted the ground. He noted a faint fuel smell when he responded to the site shortly after the accident. He reported weather conditions as misty, with a light rain at the time of the accident.

A second witness at the same location also heard an airplane that sounded like it was performing aerobatic stunts; however, he was unable to see it because of the low cloud cover. About one minute after hearing it, he observed that airplane exit the clouds in a 60 to 70-degree nose down attitude. He estimated the visibility at 1/2 mile in light rain and mist at that time.

## PERSONNEL INFORMATION

The pilot held a private pilot certificate with a single-engine land airplane rating issued on April 22, 2010. Federal Aviation Administration (FAA) records indicated that the pilot did not hold an instrument rating. He was issued a third-class airman medical certificate, with a restriction for corrective lenses, on June 28, 2011.

The pilot had logged about 207 hours total flight time, with approximately 114 hours flight time in the accident airplane. The pilot's logbook included a high performance airplane endorsement, and he met the requirement for a flight review (14CFR61.56) based on successful completion of the private pilot practical test within the preceding 24 months.

The pilot had logged 153.7 hours as pilot-in-command (PIC) and 78.7 hours as dual instruction received. Of that flight time, 42.0 hours were logged as both PIC and dual received, which is permitted under regulations when a current, certificated pilot is receiving flight instruction. However, of the 42.0 hours logged as PIC and dual instruction received, 38.1 hours were not endorsed by a flight instructor, which is required by regulations.

The pilot had logged 3.1 hours of simulated instrument flight time. He had also logged 28.6 hours of actual instrument flight time. However, for each flight in which actual instrument flight was logged, the actual instrument time entered was equal to the total time for the entire flight. Regulations (14 CFR 61.51) permit pilots to log instrument flight time only when they are controlling an aircraft solely by reference to the flight instruments.

## AIRCRAFT INFORMATION

The accident airplane was a Cirrus Design model SR20, serial number 1110. It was a four-place, low wing, single engine airplane, with a tricycle landing gear configuration. The airplane was issued an FAA normal category standard airworthiness certificate on December 30, 2000. The airplane was powered by a 210-horsepower Continental Motors IO-360-ES six-cylinder, reciprocating engine, serial number 827771-R. The engine was manufactured in August 2008.

The airframe had accumulated 1,758.7 hours total time in-service at the time of the accident. Maintenance records indicated that the engine was installed on the airframe in December 2008. At the time of the accident, it had accumulated 459.8 hours since new. The most recent annual inspection was completed on April 5, 2011, at 1,604.4 hours airframe time.

According to maintenance records, the most recent maintenance action was accomplished on November 21, 2011. The engine spark plugs were replaced and the fuel injectors were cleaned. In addition, both main landing gear tires were replaced, and the right main landing gear brake pads were replaced. There were no subsequent entries in the maintenance logbooks.

## METEOROLOGICAL INFORMATION

The National Weather Service (NWS) Surface Analysis Chart, valid at 0900, depicted a low pressure system over Wisconsin, with an occluded front extending southward. The occluded

front extended into a cold front across eastern Iowa and into Missouri. The NWS Weather Depiction Chart, valid at 1000, depicted an extensive area of IFR conditions over northern Illinois.

A review of DPA surface weather observations indicated that marginal visual flight rules (MVFR) conditions prevailed until approximately 1 hour prior to the accident. MVFR conditions are defined as cloud ceilings of between 1,000 feet and 3,000 feet above ground level (agl), and /or visibilities of between 3 and 5 miles. After that time, instrument flight rules (IFR) conditions prevailed at DPA. IFR conditions are defined as cloud ceilings below 1,000 feet agl and/or visibility below 3 miles.

Weather conditions recorded by the DPA Automated Surface Observing System (ASOS), located about 22 miles south of the accident site, at 1029, were: wind from 170 degrees at 11 knots, visibility 1-3/4 miles in light rain and mist, overcast clouds at 900 feet agl, temperature 10 degrees Celsius, dew point 8 degrees Celsius, and altimeter 29.85 inches of mercury.

Prior to the accident, at 0852, the DPA observation included overcast clouds at 1,300 feet agl and 9 miles visibility. At 0935, the DPA observation included overcast clouds at 900 feet agl and 10 miles visibility. At 0952, weather conditions at DPA had deteriorated to 900 feet agl overcast, with 3 miles visibility in light rain and mist.

Weather conditions recorded by the Chicago Executive Airport (PWK) Automated Surface Observing System (ASOS), located about 23 miles east of the accident site, at 1024, were: wind from 200 degrees at 12 knots, visibility 7 miles in light rain, overcast clouds at 1,300 feet agl, temperature 10 degrees Celsius, dew point 9 degrees Celsius, and altimeter 29.88 inches of mercury.

Weather conditions recorded by the Chicago Midway Airport (MDW) Automated Surface Observing System (ASOS), located about 40 miles southeast of the accident site, at 1051, were: wind from 200 degrees at 9 knots, visibility 6 miles in light rain and mist, broken clouds at 1,700 feet agl, overcast clouds at 3,000 feet agl, temperature 12 degrees Celsius, dew point 9 degrees Celsius, and altimeter 29.85 inches of mercury.

An Airmen's Meteorological Information (AIRMET) advisory warning of possible IFR conditions was valid at the time of the accident flight. AIRMET Sierra (update 3) was issued at 0845 and was valid until 1500. The area specified in the AIRMET included northern Illinois, eastern Iowa, and southern Wisconsin.

The DPA Terminal Area Forecast (TAF), in effect from 0600, expected weather conditions at 1000 to be: wind from 200 degrees at 12 knots, gusting to 19 knots; visibility 6 miles in light rain showers and mist; broken clouds at 2,500 feet agl, and overcast clouds at 3,500 feet agl. The DPA TAF was amended at 0915. The amended forecast expected weather conditions at 1000 to be: wind from 190 degrees at 12 knots; visibility 5 miles in light rain, drizzle, and mist; and overcast clouds at 800 feet agl.

The current Area Forecast (FA) was issued at 0545. Between 0900 and 1100, the FA expected a broken to overcast cloud layer from 1,500 to 2,500 feet agl, and an overcast cloud ceiling at 4,000 feet agl with cloud layers to 26,000 feet mean sea level over northern Illinois. It also forecast scatter light rain showers. The outlook was for IFR conditions due to cloud ceilings, with rain showers and mist.

There was no record that the pilot had contacted flight service for a formal preflight weather briefing related to the accident flight. In addition, there was no record that the pilot logged into the Direct User Access Terminal Service (DUATS) to obtain weather or flight information.

A pilot and flight instructor reported that they were en route from Rockford (RFD) to 3CK on an IFR training flight at the time of the accident. They were in solid instrument meteorological conditions (IMC) at their cruise altitude of 5,000 feet msl. They both recalled breaking out of the clouds at 1,300 feet msl (approximately 400 feet agl) during the instrument approach into 3CK. They encountered light rain; but they did not encounter any icing during the flight.

#### WRECKAGE AND IMPACT INFORMATION

The airplane impacted a tree and an open agricultural field about 4 miles north-northwest of Lake in the Hills Airport (3CK). Multiple tree limbs up to about 4 inches in diameter exhibiting fresh breaks were distributed over an approximate 45-foot by 45-foot area immediately north of the tree. The wreckage path was oriented on a bearing of approximately 009 degrees magnetic. The debris field was about 400 feet long by 85 feet wide originating at the tree struck during the accident sequence.

The main wreckage came to rest approximately 97 feet north of the tree. The engine was separated from the airframe and the engine mount was fragmented. The engine came to rest inverted about 155 feet from the main wreckage. The propeller assembly separated from the engine aft of the propeller flange and came to rest approximately 131 feet from the main wreckage. The vertical stabilizer, with the rudder attached, separated from the fuselage. It came to rest about 30 feet north of the main wreckage.

The main wreckage consisted of the fuselage, right wing, and horizontal stabilizer. The cabin area was compromised and the fuselage was fragmented. The right wing was separated from the fuselage. Portions of the fiberglass wing structure were separated and delaminated. The right aileron remained attached to the wing. The right flap was separated and located within the debris field. The horizontal stabilizer was separated from the fuselage. The fiberglass stabilizer structure was delaminated and fragmented. The left and right elevators had separated from the stabilizer and were located within the debris field.

The left wing had separated from the fuselage. The outboard section, from the wing tip to about midspan, came to rest approximately 55 feet east of the main wreckage. A section of the lower left wing structure, including the left main landing gear strut and wheel assembly, was located about 30 feet west of the main wreckage. The remainder of the inboard portion of

the left wing was fragmented. The left aileron was separated from the wing and came to rest about 275 feet north of the main wreckage. The left flap had separated from the wing and was located within the debris field.

Postaccident examinations did not reveal any anomalies consistent with a preimpact failure or malfunction.

#### MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was performed by the McHenry County Coroner's Office, Woodstock, Illinois, on November 28, 2011. The pilot's death was attributed to injuries received in the accident.

Toxicology testing was performed by the FAA Civil Aerospace Medical Institute. Testing results were negative for all substances in the screening profile.

#### ADDITIONAL INFORMATION

A review of radar track data for the accident flight indicated that it was operating in Class E airspace while in the Chicago metropolitan area, with the exception of the vicinity of DPA. Within approximately 5 miles of DPA, the flight was operating in Class D airspace. Regulations require pilots operating under basic VFR in Class D and Class E airspace to remain at least 500 feet below and 2,000 feet horizontally from any cloud formation. Visibility of at least 3 miles is also required for such operations.

In order to takeoff or land at an airport located within Class D airspace under VFR, any cloud ceiling must be at or above 1,000 feet agl and the visibility must be at least 3 miles. In the case of weather conditions that are less than basic VFR, a pilot may request a special VFR clearance from air traffic control. Regulations pertaining to special VFR operations (14 CFR 91.157) require pilots to remain clear of clouds, with no additional cloud clearance distance requirements. The flight visibility must be at least 1 mile.

FAA procedures for air traffic control (Order 7110.65U) allow controllers to authorize special VFR operations for aircraft operating in class D airspace. However, special VFR may only be initiated by the pilot [§7-5-1 (a)(3)]. The order makes no provision for the controller to suggest special VFR operations to a pilot or to initiate special VFR operations on behalf of a pilot.

A ticket for an Indianapolis Colts football game, valid for Sunday, November 27, 2011, was located in the accident debris field.



## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	46, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	June 28, 2011
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	April 22, 2010
<b>Flight Time:</b>	207 hours (Total, all aircraft), 114 hours (Total, this make and model), 153 hours (Pilot In Command, all aircraft), 27 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	CIRRUS DESIGN CORP	<b>Registration:</b>	N223CD
<b>Model/Series:</b>	SR20	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	1110
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	April 5, 2011 Annual	<b>Certified Max Gross Wt.:</b>	2900 lbs
<b>Time Since Last Inspection:</b>	154 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	1759 Hrs at time of accident	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	IO-360-ES
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	180 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Instrument (IMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	DPA,759 ft msl	<b>Distance from Accident Site:</b>	22 Nautical Miles
<b>Observation Time:</b>	10:29 Local	<b>Direction from Accident Site:</b>	168°
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	2 miles
<b>Lowest Ceiling:</b>	Overcast / 900 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	11 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	170°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.85 inches Hg	<b>Temperature/Dew Point:</b>	10°C / 8°C
<b>Precipitation and Obscuration:</b>	N/A - None - Mist		
<b>Departure Point:</b>	Marion, IN (MZZ )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	West Chicago, IL (DPA )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	08:30 Local	<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	DuPage Airport DPA	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	759 ft msl	<b>Runway Surface Condition:</b>	
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	3 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	4 Fatal	<b>Latitude, Longitude:</b>	42.268054,-88.381942

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Sorensen, Timothy
<b>Additional Participating Persons:</b>	Michael Machnik; FAA – DuPage Flight Standards; West Chicago, IL Brad Miller; Cirrus Design Corp.; Duluth, MN Rodney Martinez; Continental Motors Inc.; Mobile, AL
<b>Original Publish Date:</b>	May 15, 2012
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=82388">https://data.nts.gov/Docket?ProjectID=82388</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).