



Aviation Investigation Final Report

Location:	Farmington, New Mexico	Accident Number:	WPR19FA103
Date & Time:	March 31, 2019, 14:39 Local	Registration:	N173CT
Aircraft:	Cirrus SR22	Aircraft Damage:	Destroyed
Defining Event:	VFR encounter with IMC	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The noninstrument-rated pilot departed on a visual flight rules (VFR) cross-country flight. About 25 minutes after takeoff, the airplane reached its highest altitude of 17,300 ft mean sea level (msl) and was approaching a line of precipitation and thunderstorms. About 20 minutes later, the airplane entered a descent at a rate of about 1,000 ft per minute. The airplane then leveled off at an altitude of about 8,575 ft msl (about 3,000 ft above ground level), about 1,000 ft below the predicted cloud base, and a short time later, the airplane transitioned to a right descending turn that continued until ground contact, reaching a descent rate of about 5,175 ft per minute. The debris field and fragmentation of the airplane was consistent with a high-speed, right-wing-low impact. Examination of the wreckage did not reveal any anomalies with the airframe or engine that would have precluded normal operation, and there was no evidence of an inflight breakup. The airplane's airframe parachute system was not deployed.

Analysis of weather information indicated that the airplane likely encountered a line of developing and expanding rain showers, with updraft and downdraft conditions, precipitation, and reduced visibility as the pilot likely descended to fly under the cloud bases. Due to the developing and expanding rain shower line, outflow boundaries and low-level wind shear conditions were likely present in the area at the accident time.

A convective SIGMET as well as AIRMETs for instrument flight rules conditions, mountain obscuration, and moderate icing were valid for the route of flight and in the area of the accident site at the accident time. When activating his flight plan, the pilot indicated to the weather briefer that he was aware of the AIRMETs; however, whether he was aware of the SIGMET was not determined based on the available information.

Although the pilot did not receive an official weather briefing, records suggest that he downloaded weather imagery three days before the flight. He had an active subscription to a commercial satellite weather service for the airplane, which was also equipped with multiple

avionics devices capable of receiving and displaying weather information. Whether or to what extent the pilot accessed weather imagery in-flight could not be determined.

The reduced visibility and the pilot’s lack of experience in flight by reference to instruments provided conditions conducive to the development of spatial disorientation, and the airplane’s descending turn, rapid descent, and high-speed impact with the ground were consistent with the known effects of spatial disorientation. Given the available information, it is likely that the noninstrument-rated pilot encountered instrument meteorological conditions as he continued toward and subsequently attempted to fly below an area of rain shower and thunderstorm activity, and experienced spatial disorientation that resulted in a loss of airplane control.

Probable Cause and Findings

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

The noninstrument-rated pilot's continued visual flight rules flight into an area of forecast instrument meteorological conditions, which resulted in spatial disorientation and a subsequent loss of control.

Findings

Personnel issues	Decision making/judgment - Pilot
Aircraft	(general) - Not attained/maintained
Environmental issues	Clouds - Effect on personnel
Personnel issues	Spatial disorientation - Pilot

Factual Information

History of Flight

Enroute-cruise	VFR encounter with IMC (Defining event)
Enroute-cruise	Loss of visual reference
Enroute-cruise	Loss of control in flight
Enroute-cruise	Collision with terr/obj (non-CFIT)

On March 31, 2019, about 1439 mountain daylight time (MDT), a Cirrus SR-22, N173CT, was destroyed when it was involved in an accident near Farmington, New Mexico. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The cross-country flight departed Cal Black Memorial Airport (U96), Halls Crossing, Utah, about 1345 with a planned destination of Big Spring Mc Mahon-Wrinkle Airport (KBPG), Big Spring, Texas. According to the pilot's family, he did not have any meetings or appointments that necessitated his return by a specific time, and he had flown the accident route of flight at least a dozen times before and was familiar with the terrain.

Federal Aviation Administration (FAA) automatic dependent surveillance-broadcast (ADS-B) data (See Figure 1) revealed the accident airplane depart at 1351 and climb on an eastbound heading. While the target was climbing out of a transponder-reported altitude of 9,125 ft mean sea level (msl), the accident pilot contacted Cedar City Flight Service Station to activate a visual flight rules (VFR) flight plan. During that exchange, the briefer asked the pilot if he had the AIRMET advisory for icing and mountain obscuration for the planned route of flight, and the pilot reported that he did.

About 1400, the target had reached 14,000 ft msl, and about that time, the pilot contacted the Denver Air Route Traffic Control Center (ZDV) requesting VFR flight following services. The controller issued the airplane a discrete transponder code, and a few minutes later, advised the pilot that he had established radar contact with the airplane and provided the nearest altimeter setting.

By 1409, the airplane had reached its highest altitude of 17,300 ft msl and was about 50 nautical miles southeast of U96. A few minutes later, the target turned left and began to track east. For the next 7 minutes, the track began to slowly transition back to the southeast, after which the pilot was provided and acknowledged a frequency change by the ZDV controller.

At 1428, the airplane was about 24 miles southwest of Four Corners Regional Airport (KFMN), and the controller provided the pilot with the KFMN altimeter setting. About that time, the airplane entered a descent to 9,300 ft.

The controller then provided the pilot with a frequency change, which the pilot read back correctly. No other radio transmissions were received from the pilot, and at 1438:10, the airplane had descended to 8,575 ft msl (about 3,000 ft agl) and began a descending right turn. The radius of the turn was about 3,200 ft, during which the airplane was traveling at about 187 mph. The last recorded return from the airplane occurred 20 seconds later, with the airplane at 6,850 ft msl on a southbound track. The altitudes measured over the last 20 seconds corresponded to a descent rate of about 5,175 ft per minute.

An FAA alert notice (ALNOT) was issued at 1512. A search and rescue mission conducted by the Civil Air Patrol and the New Mexico State Police located the wreckage about 1700.



Figure 1. ADS-B-derived flight track. Final turn inset

Pilot Information

Certificate:	Private	Age:	59, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	4-point
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:	March 28, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	September 3, 2017
Flight Time:	(Estimated) 370 hours (Total, all aircraft), 100 hours (Total, this make and model)		

The pilot held a private pilot certificate with a rating for airplane single-engine land, issued in September 2015.

The pilot's flight logbooks were not recovered; however, at the time of his last FAA medical examination, dated March 28, 2017, he reported 270 total hours flight experience, 64 of which occurred in the previous six months.

Between August 27, 2017, and September 3, 2017, the pilot attended a Cirrus transition training course in Abilene, Texas. The training included 10.9 hours of flight experience in a Cirrus SR22TN equipped with an Avidyne Entegra avionics suite, and 8.5 hours of ground instruction.

Aircraft and Owner/Operator Information

Aircraft Make:	Cirrus	Registration:	N173CT
Model/Series:	SR22	Aircraft Category:	Airplane
Year of Manufacture:	2008	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	2961
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	July 2, 2018 Annual	Certified Max Gross Wt.:	3600 lbs
Time Since Last Inspection:	95 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	1519.5 Hrs as of last inspection	Engine Manufacturer:	Continental Motors
ELT:	C126 installed, not activated	Engine Model/Series:	IO-550-N (50B)
Registered Owner:		Rated Power:	310 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

The pilot purchased the airplane on July 25, 2017. It was certified for instrument flight rules (IFR) operation, and equipped with Avidyne FlightMax primary and multifunction displays, a Garmin GNS 430, and a set of conventional backup instruments. Additionally, a satellite weather data receiver was included, and the pilot had an active weather package subscription at the time of the accident.

Fueling records provided by a fixed based operator at U96 indicated that the pilot serviced the airplane with the addition of 65.2 gallons of 100 low-lead aviation gasoline at 2217 on the evening of March 29. There was no evidence the airplane had flown between that time and the accident flight.

The airplane was equipped with a “No Hazard” de-ice system, which was designed for inadvertent entry into icing conditions and not certified for flight into known icing conditions. The airplane was equipped with a Cirrus Airframe Parachute System (CAPS), which had a demonstrated maximum deployment speed of 133 kts indicated airspeed.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KFMN, 5506 ft msl	Distance from Accident Site:	33 Nautical Miles
Observation Time:	14:53 Local	Direction from Accident Site:	342°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	Broken / 4000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	50°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.12 inches Hg	Temperature/Dew Point:	9°C / -3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Halls Crossing, UT (U96)	Type of Flight Plan Filed:	VFR
Destination:	Big Spring, TX (BPG)	Type of Clearance:	None
Departure Time:	13:45 Local	Type of Airspace:	Class E

A Bureau of Land Management law enforcement officer who responded to the accident site stated that, upon his arrival skies were clear, but the ground was wet with rain from a shower that had passed through the area a few hours prior.

Surface Observations

The closest official weather observation station to the accident site was located at KFMN, about 33 miles north-northwest at an elevation of 5,506 ft. The station reported VFR conditions throughout the morning of the accident, with light rain and gusting winds to 26 knots observed at 1553, and a peak wind of 29 knots observed at 1528.

Weather Advisories

The National Weather Service (NWS) Storm Prediction Center (SPC) issued a Day 1 Convective Outlook at 1030 and 1330, indicating areas of general thunderstorms forecast for the accident site during the accident period. (See Figure 2.)

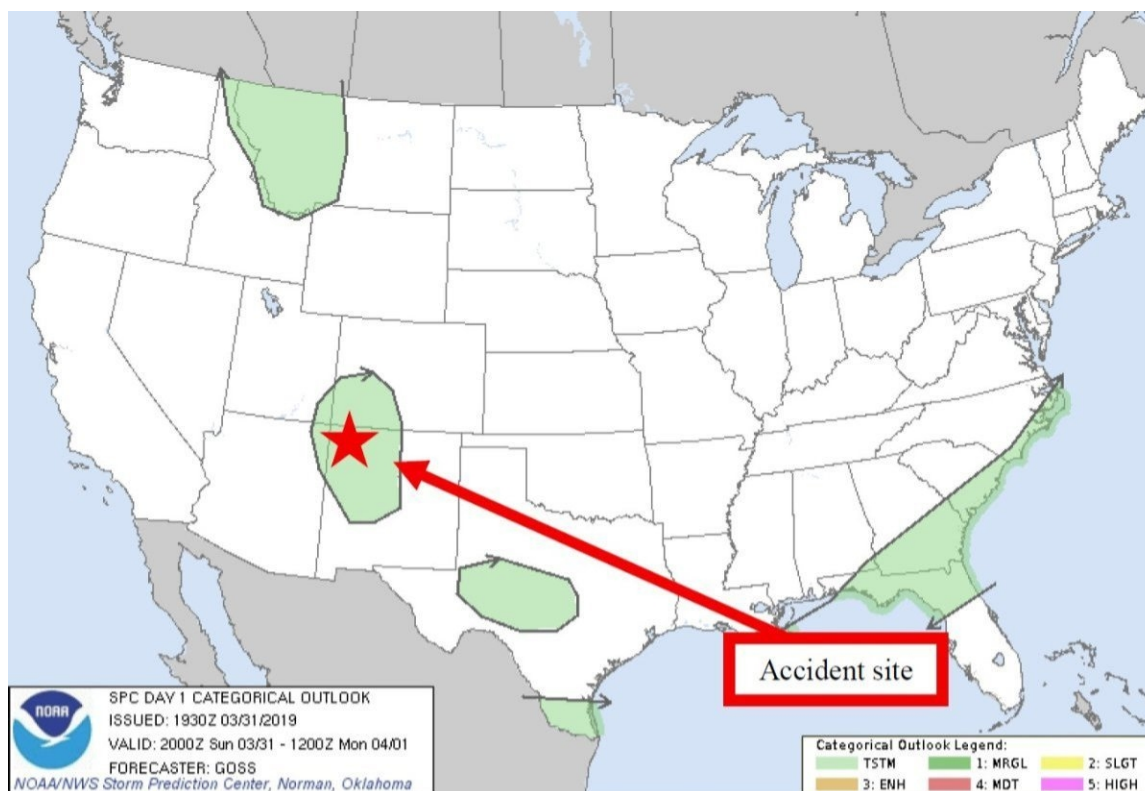


Figure 2. SPC day 1 Convective Outlook valid at the time of the accident

The NWS Aviation Weather Center issued a convective SIGMET at 1255, which was valid through 1455 along the route of flight. It warned of an area of embedded thunderstorms with tops to 29,000 ft msl with the warning area moving from 330° at 20 knots.

AIRMETs Sierra and Zulu were valid for the route of flight and the accident site at the accident time. The AIRMETs warned of IFR conditions due to precipitation and mist, mountain obscuration conditions due to clouds, precipitation, and mist, and moderate icing between 8,000 ft and 18,000 ft msl.

Upper Air Data

A High-Resolution Rapid Refresh (HRRR) model sounding for the area of the accident site depicted the convective condensation level at 5,067 ft agl (11,186 ft msl) and the lifted condensation level and level of free convection at 5,810 ft agl (11,929 ft msl). The freezing level was located at 8,132 ft msl, and the precipitable water value was 0.29 inches.

The sounding indicated an unstable to conditionally unstable environment from the surface through 19,000 ft, with a lifted index of -4. There was a possibility of clouds from 11,000 ft msl through 14,000 ft msl (about 5,000 ft to 8,000 ft agl). A positive Convective Available Potential Energy (CAPE) value of 399 Joules/kilogram (J/kg) was indicated on the sounding and the maximum vertical velocity for this atmosphere was calculated as about 5,510 ft per minute. Downdraft CAPE was measured at 85 J/kg. If rain showers or thunderstorms formed in this environment, the 1500 HRRR sounding indicated that the strongest wind speeds possible at

the surface (due to, for example, a microburst, outflow boundary, or gust front) would have been from 25 knots to 32 knots, depending on model parameters.

Satellite Data

Visible satellite imagery at 1430 and 1445 indicated a band of cumuliform clouds above the accident site at the accident time. The cloud cover and cumuliform bands were moving from northwest to southeast with the cloud cover increasing in areal coverage with time. The airplanes track flew directly under the cumuliform band. (See Figure 3.)

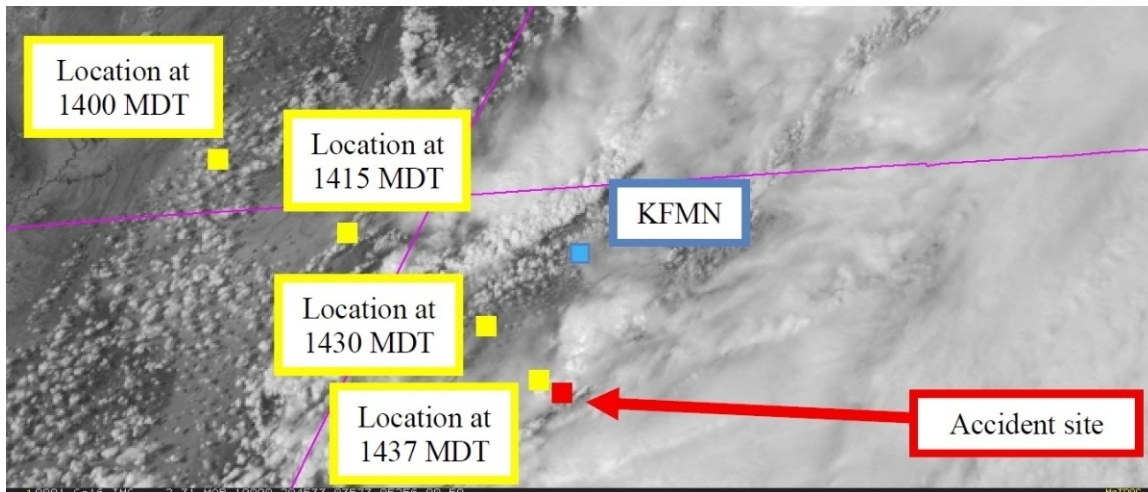


Figure 3. GOES-16 visible image at 1445

The GOES-16 infrared imagery, along with the 1500 HRRR sounding, indicated approximate cloud top heights over the accident site of 18,000 ft at 1445.

Radar Imagery Information

A regional view of the NWS national composite radar mosaic depicted echoes from 20 to 30 dBZ above the accident site at the accident time. The KABX Weather Surveillance Radar-1988 Doppler (WSR-88D) (located 87 miles southeast of the accident site) base reflectivity values were between 15 and 25 dBZ above the accident site at the accident time. The reflectivity bands were moving from west to east and expanding in areal coverage with time. Based on the radar beam height calculations, the elevation scan depicted the conditions between 11,760 ft and 20,340 ft msl over the accident site but was unable to see the altitudes below and to the ground.

Pilot Weather Awareness

The airplane was equipped with a Garmin GTX-345 ADS-B "In"/"Out" Transponder, and the pilot was using an iPad configured with the ForeFlight "Electronic Flight Bag" application. The ForeFlight application can receive subscription-free, FAA-sourced weather via the GTX-345 using the FAA's Flight Information System-Broadcast network (FIS-B). Weather information provided through FIS-B includes the NEXRAD mosaic map, lightning, turbulence, forecast icing, cloud tops, and airport surface observations. When the application retrieves weather

data through the internet, a record of the transaction is logged remotely at the ForeFlight data facility; however, the application's use of FIS-B weather is not logged remotely.

The iPad was recovered from the accident site but sustained significant damage, and its pre-accident operational status could not be determined.

The Avidyne multifunction display was also capable of displaying weather information utilizing the SiriusXM satellite weather service, along with FIS-B weather; however, damage to the unit precluded a confirmation that it was receiving either type of data.

A search of archived ForeFlight information indicated that the pilot requested weather information and filed a VFR flight plan via the application on March 29, with a planned departure of 1500 on March 31. The data provided contained standard weather information, valid at 2112 on March 30, but none of the weather forecast information was valid past 1200 on March 31.

During the flight, the pilot made a minor route change in the ForeFlight application, which updated the route string and winds aloft information, but there was no record of the pilot receiving or retrieving any additional weather information. The pilot most recently viewed weather imagery on the ForeFlight application on March 27; access to FIS-B data would not have been logged.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	36.218334,-108.016387

The wreckage was located in flat, high desert terrain at an elevation of about 6,185 ft msl, 450 ft southwest of the last recorded radar target, and 30 miles south of FMN.

The first identified point of impact was a 4-ft-deep by 10-ft-wide crater, which contained the nose landing gear assembly, two propeller blades, and fragmented engine and airframe components. Two matching linear impact marks, the total length of which corresponded to the airplane's wingspan, extended from the crater on a north-south heading. The right wingtip and green navigation lens fragments were found at the tip of the northern mark, and red navigation lens fragments were located at the tip of the southern mark.

The debris field was 450 ft long oriented on a heading of about 210°. The engine came to rest about 30 ft beyond the crater, and the remainder of the debris comprised fragmented pieces of composite main cabin and wing structure, extending out to a width of about 100 ft. The ailerons, elevators, and flaps were crushed and distributed throughout the debris field, and the farthest components were the left forward seat and a fuel tank cap.

The rocket-powered airframe parachute was located in the center of the debris field. The harness cables remained attached to their respective airframe fittings, and the top of the parachute canopy remained folded evenly along its pleats and had not unfurled. Although the canopy lines had extended to their full length, the solid-fuel rocket motor remained attached to the parachute assembly and had not been expended, consistent with the parachute system not having been activated in flight.

The engine sustained significant impact damage, liberating the oil sump, most of the accessories, and bending the forward cylinders aft. Internal examination did not reveal any evidence of catastrophic failure, and examination of the spark plugs revealed wear signatures and coloration consistent with normal operation. The turbine and compressor wheels for both turbochargers were impinged against their respective housings and exhibited bending damage to their tips opposite the direction of rotation.

The airplane was equipped with a crash-hardened recoverable data module, installed in the vertical stabilizer. The unit was designed to record flight, engine, and autopilot parameters, logged once per second, and stored internally on a compact flash (CF) card. Examination revealed that the unit was undamaged; however, review of the data in the CF card revealed that the last recorded flight occurred on October 13, 2018. There were no data pertinent to the accident recorded on the device.

The MFD unit was also capable of storing engine and aircraft parameters on a CF card; however, the entire unit sustained significant impact damage, and the card was bent in half. The extent of the damage precluded recovery of any data pertinent to the accident flight.

Additional Information

The airplane flew almost directly over Shiprock Airstrip (5V5), Shiprock, New Mexico, about 12 minutes before the accident. KFMN was located about 10 minutes' flight time to the north.

Sunset at the accident site occurred at 1933 MDT, and 2005 CDT at the destination airport. The pilot indicated on the flight plan an estimated time enroute of 3 hours 31 minutes, with 5 hours and 19 minutes of fuel onboard and a cruise altitude of 17,500 ft.

Medical and Pathological Information

An autopsy performed by the New Mexico Office of Medical Investigators revealed that the pilot died as a result of multiple blunt force trauma injuries. Due to the trauma, the autopsy could not determine if significant natural disease was present. The medical examiner reported that the oxygen supply tube and a cannula were comingled with the pilot.

Toxicology testing performed by the FAA Forensic Sciences Laboratory did not identify the presence of any screened drug substances or ingested alcohol.

Review of FAA medical certificates and supporting documentation indicated that the pilot reported no significant medical concerns, and during his most recent FAA medical examination, the aviation medical examiner identified no significant conditions.

Administrative Information

Investigator In Charge (IIC):	Simpson, Elliott		
Additional Participating Persons:	Vernon Rockett; Federal Aviation Administration FSDO; Albuquerque, NM Michael H Council; Continental Motors; Mobile, AL Brannon Mayer; Cirrus Aircraft; Duluth, MN		
Original Publish Date:	September 16, 2021	Investigation Class:	3
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=99197		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).