



# Aviation Investigation Final Report

---

<b>Location:</b>	Modesto, California	<b>Accident Number:</b>	WPR23FA092
<b>Date &amp; Time:</b>	January 18, 2023, 13:07 Local	<b>Registration:</b>	N4765G
<b>Aircraft:</b>	Cessna 414	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

---

## Analysis

Shortly after taking off, the pilot was instructed to change from the airport tower frequency to the departure control frequency. Numerous radio transmissions followed between tower personnel and the pilot that indicated the airplane's radio was operating normally on the tower frequency, but the pilot could not change frequencies to departure control as directed. The pilot subsequently requested and received approval to return to the departure airport. During the flight back to the airport, the pilot made radio transmissions that indicated he continued to troubleshoot the radio problems.

The airplane's flight track showed the pilot flew directly toward the runway aimpoint about 1,000 ft from, and perpendicular to, the runway during the left base turn to final and allowed the airplane to descend as low as 200 ft pressure altitude (PA). The pilot then made a right turn about .5 miles from the runway followed by a left turn towards the runway. A pilot witness near the accident location observed the airplane maneuvering and predicted the airplane was going to stall. The airplane's airspeed decreased to about 53 knots (kts) during the left turn and video showed the airplane's bank angle increased before the airplane aerodynamically stalled and impacted terrain. Postaccident examination of the airframe, engines, and review of recorded engine monitoring data revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

Toxicology testing showed the pilot had diphenhydramine, a sedating antihistamine, in his liver and muscle tissue. While therapeutic levels could not be determined, side effects such as diminished psychomotor performance from his use of diphenhydramine were not evident from operational evidence. Thus, the effects of the pilot's use of diphenhydramine was not a factor in this accident.

The accident is consistent with the pilot becoming distracted by the reported non-critical radio anomaly and turning base leg of the traffic pattern too early during his return to the airport. The pilot then failed to maintain adequate airspeed and proper bank angle while maneuvering from base leg to final approach, resulting in an aerodynamic stall and impact with terrain.

### Probable Cause and Findings

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

The pilot's exceedance of the airplane's critical angle of attack and failure to maintain proper airspeed during a turn to final, resulting in an aerodynamic stall and subsequent impact with terrain. Contributing to the accident was the pilot's distraction due to a non-critical radio anomaly.

#### Findings

<b>Aircraft</b>	VHF communication system - Unknown/Not determined
<b>Personnel issues</b>	Attention - Pilot
<b>Personnel issues</b>	Task overload - Pilot
<b>Personnel issues</b>	Aircraft control - Pilot
<b>Aircraft</b>	Lateral/bank control - Capability exceeded
<b>Aircraft</b>	Airspeed - Not attained/maintained

## Factual Information

### History of Flight

<b>Approach</b>	Comm system malf/failure
<b>Approach-VFR pattern base</b>	Miscellaneous/other
<b>Approach-VFR pattern base</b>	Loss of control in flight (Defining event)

On January 18, 2023, at 1307 Pacific daylight time, a Cessna 414 airplane, N4765G, was destroyed when it was involved in an accident near Modesto, California. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The airplane departed runway 10L at Modesto City-County Airport-Harry Sham Field (MOD), Modesto, California, at 1259. According to the Modesto tower controller, the pilot's planned destination was Buchanan Field Airport (CCR), Concord, California.

ADS-B flight data showed that the airplane climbed to 3,200 ft PA as it made a right turn and departed to the northwest, reaching about 150 kts. At 1301, the Modesto local tower controller instructed the pilot to switch radio frequencies to Northern California Terminal Radar Approach Control. The pilot responded that he was switching frequencies, but his subsequent radio transmission was on the MOD frequency. The pilot made several more radio transmissions that indicated he was attempting to change radio frequencies, but that his radio was not changing frequencies. The tower controller asked the pilot if he wanted to return to MOD, and the pilot responded that he did. The pilot was then instructed to make a left 180° turn and enter a left downwind pattern to runway 28 right (28R).

The flight track data showed that about 1302 the airplane made a left turn back to the southeast and paralleled the runway about 3 miles west of MOD before descending and flying a non-standard traffic pattern for runway 28R. At 1304, the pilot queried the tower controller if they could hear him, and the tower controller responded that they had heard all his transmissions. The pilot again stated that his radio was not changing frequencies.

At 1305, the flight track data showed the airplane had descended to a PA of about 1,500 ft and a groundspeed of 96 kts and was abeam the runway 28R threshold and the controller asked if he had the runway in sight. The pilot replied that he did have the runway in sight, and he was subsequently cleared to land. The pilot was informed runway 28R "was the long runway" and he read back that he was cleared to land runway 28R. The airplane then made a left base turn to the northeast on a heading directly towards the runway threshold.

During the left base turn, the airplane angled further left towards a point about 1,000 ft beyond the runway 28R threshold and maintained a groundspeed of about 90 kts and continued to descend until it reached 200 PA about 0.5 miles from the runway. The airplane then entered a right turn to about a 090° heading before it started a left turn to the north. During the left turn, the groundspeed decreased from about 72 kts to 53 kts and the altitude decreased to 100 ft PA when the last ADS-B return was recorded at 1306:56 near site of the accident (Figure 1).

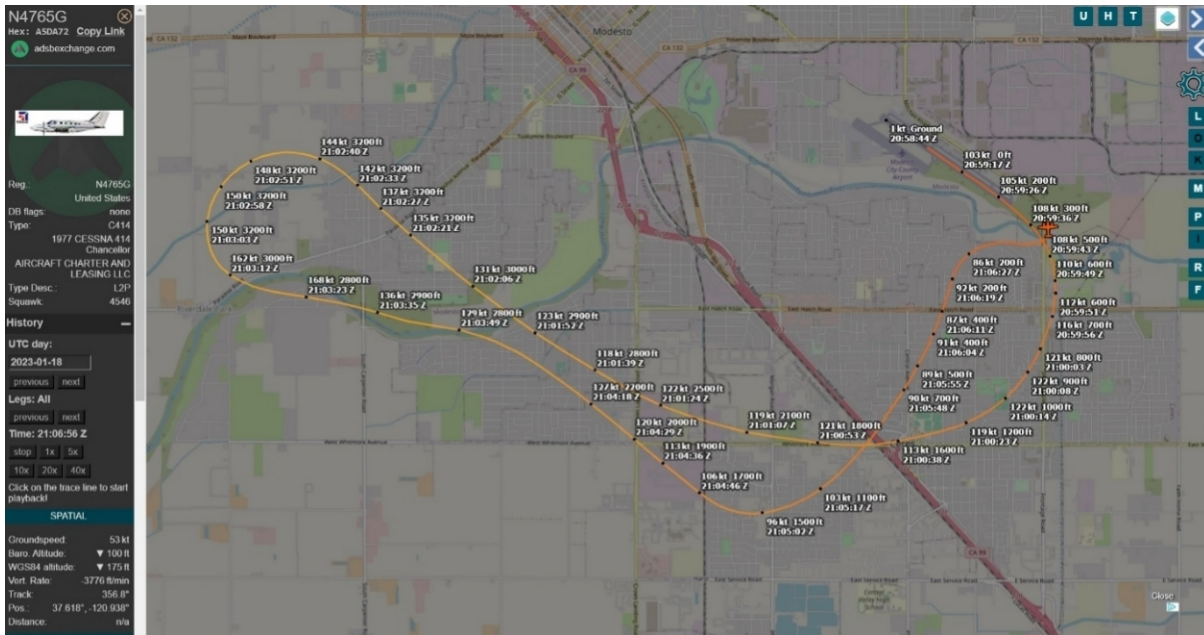


Figure 1 – ADS-B Flight Track

An aeromedical helicopter pilot and flight nurse reported they had just departed a hospital helipad about three miles north of MOD when they heard a pilot on the MOD tower frequency asking the controller if he could hear the pilot. The tower controller responded that they heard the pilot the entire time. The helicopter crew then observed the airplane maneuvering on what they thought was a downwind leg of the traffic pattern. They said the airplane was doing unusual maneuvers, “like S-turns.” The flight nurse, who was a private pilot, told the crew that the pilot was going to stall the airplane. A few seconds later, they witnessed the airplane stall and spin to the ground. Another witness, who was about a mile from the accident site, observed the airplane’s departure and then the final moments of the flight. He said the engines sounded normal as the airplane departed and returned, and he heard the engines rpm increase as the airplane descended in a spin.

Dash camera video was obtained from an unknown witness that showed the final seconds of the flight. The video showed the airplane’s bank angle increase, the nose drop, and the airplane enter a near vertical left spin (Figure 2).



Figure 2 – Dash Camera Capture, 3 Seconds Before Impact

### Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	80, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<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>	January 9, 2022
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	July 31, 2022
<b>Flight Time:</b>	4506 hours (Total, all aircraft), 9.3 hours (Last 90 days, all aircraft), 1.1 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N4765G
<b>Model/Series:</b>	414	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1977	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	414-0940
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	7
<b>Date/Type of Last Inspection:</b>	January 4, 2023 Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>	0.5 Hrs	<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	3574 Hrs as of last inspection	<b>Engine Manufacturer:</b>	CONT MOTOR
<b>ELT:</b>	C91 installed, activated, aided in locating accident	<b>Engine Model/Series:</b>	TSIO-520 SER
<b>Registered Owner:</b>	AIRCRAFT CHARTER AND LEASING LLC	<b>Rated Power:</b>	300 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

The airplane had undergone an annual inspection at MOD that was completed January 4, 2023. The airplane remained at MOD until the pilot picked it up on the day of the accident. Fueling records indicate the airplane was refueled with 73.5 gallons of AvGas (100LL) on January 18, 2023.

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	MOD,87 ft msl	<b>Distance from Accident Site:</b>	1 Nautical Miles
<b>Observation Time:</b>	12:53 Local	<b>Direction from Accident Site:</b>	330°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	6 knots /	<b>Turbulence Type Forecast/Actual:</b>	None /
<b>Wind Direction:</b>	200°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.08 inches Hg	<b>Temperature/Dew Point:</b>	10.6°C / 5°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Modesto, CA (MOD)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Concord, CA (CCR)	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	12:59 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	MODESTO CITY-COUNTY-HARRY SHAM FLD MOD	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	99 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Traffic pattern

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	N/A	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal	<b>Latitude, Longitude:</b>	37.618304,-120.93793

The airplane impacted soft terrain and was resting about 80° nose down on a 240° heading. Both the left and right engines and propellers were fully buried, with just the aft portions of the engines at ground level. Both the left and right wings were impact separated near the outboard edges of the wing flaps on each wing. The flap system was observed with the left flaps in the

extended position and the right flaps impact damaged (the control rod was fractured). The landing gear were in the down position.

The forward portion of the fuselage forward of the instrument panel was crushed and embedded in the ground. The fuselage was intact aft of the cockpit until just forward of the empennage. The empennage, including the left and right horizontal stabilizers and the vertical stabilizer, was bent to the right side of the aircraft. Both the left and right elevators and the rudder remained attached to the empennage.

All major structural components of the airplane were identified at the accident site. Flight control cable continuity was established from the control surfaces to the cockpit controls with overload separation at both aileron bell cranks consistent with impact damage.

Postaccident examination of the airframe and left engine revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. A complete examination of the right engine was not accomplished due to impact damage. The three propeller blades on the right engine were bent aft and exhibited leading edge polishing and chordwise scratches.

The airplane was equipped with an Insight engine data monitor that stored engine performance data. Data was recovered from the device that was dated from the day of the accident. The data did not record identical performance parameters for each engine during all phases of flight. Generally, the data for the No. 1 engine reflected higher performance numbers than the No. 2 engine. The disparity was more evident when the data reflected both engines were operating at lower power settings. No anomalous data was observed when viewing the data for each engine individually.

## **Medical and Pathological Information**

---

An autopsy of the pilot was performed by the Stanislaus County Sherriff's Coroner's Office, Modesto, California. The cause of death was blunt force injuries.

Toxicology testing performed by the Federal Aviation Administration (FAA) Forensic Sciences Laboratory detected the sedating antihistamine, diphenhydramine, in the pilot's liver and muscle tissue. Loratadine and its metabolite, desloratadine, were also identified in his liver and muscle tissue; this antihistamine is generally considered non-impairing. No blood specimens were available for toxicology testing to determine therapeutic concentrations.



Diphenhydramine is a sedating antihistamine (commonly marketed as Benadryl) and is available over the counter in many products used to treat colds, allergies, and insomnia. Diphenhydramine carries the warning that use of the medication may impair mental and physical ability to perform potentially hazardous tasks. It has a half-life of 3 to 14 hours. FAA provides guidance on wait times before flying after using this medication; post-dose observation time is 60 hours.

## Additional Information

---

The Federal Aviation Administration Airplane Flying Handbook states the following:

*“The downwind leg is a course flown parallel to the landing runway, but in a direction opposite to the intended landing direction. This leg is flown approximately 1/2 to 1 mile out from the landing runway and at the specified traffic pattern altitude. Pattern altitude is maintained until at least abeam the approach end of the landing runway. At this point, the pilot should reduce power and begin a descent. The pilot should continue the downwind leg past a point abeam the approach end of the runway to a point approximately 45° from the approach end of the runway, and make a medium-bank turn onto the base leg.”*

*“The placement of the base leg is one of the important judgments made by the pilot to set up for a good landing. The pilot accurately judges the height, distance from the approach end of the runway, and rate of descent to allow a stabilized approach, round out, and touchdown at the desired spot.”*

*“The final approach leg is a descending flightpath starting from the completion of the base-to-final turn and extending to the point of touchdown. This is probably the most important leg of the entire pattern, because of the sound judgment and precision needed to accurately control the airspeed and descent angle while approaching the intended touchdown point.”*

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Baker, Daniel
<b>Additional Participating Persons:</b>	Todd Lambeth; FAA; Fresno, CA Ricardo Ascencio; Textron Aviation; Wichita, KS
<b>Original Publish Date:</b>	August 7, 2024
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=106599">https://data.ntsb.gov/Docket?ProjectID=106599</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](#).