Aviation Investigation Final Report

Location:	AUSTIN, Nevada	**Accident Number:**	LAX00FA171
Date & Time:	April 24, 2000, 18:34 Local	**Registration:**	N67435
Aircraft:	Cessna 152	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

According to data retrieved from a handheld GPS unit, the pilot's headed up a valley while cruising at a low altitude over upsloping mountainous terrain along their flight route. The airplane was unable to out climb the rising terrain and impacted the 20-degree upsloping mountainside nearly perpendicular to its face at an elevation of 8,100-foot mean sea level while maneuvering the airplane during an attempted reverse course maneuver. In January 2000, both pilots began primary flight training at the same Texas-based flight school. In March, they were issued Private Pilot certificates, and had each received about 6 hours of dual cross-country flight training. Neither pilot had been trained in high-density altitude operations or mountain flying. The airplane had the published performance capability to overfly the mountainous terrain. However, under high density altitude standard atmospheric conditions, its maximum rate of climb was reduced to about 380 feet per minute at 62 knots indicated airspeed (70 knots true airspeed), or about 326 feet per nautical mile (nm). As evidence by the airplane's ground track, the terrain over which the airplane flew within 3 nm of the accident site increased in elevation from 7,100 to 8,100 feet msl, or about 333 feet per nm. The airplane's climb rate ability was less than the terrain's slope. No evidence of any airframe or engine mechanical malfunction was noted during the on-scene wreckage examination.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to attempt flight in an area of high rising mountainous terrain at an inadequate altitude, which resulted in an impact during a turn to reverse direction. A contributing factor was the pilot's lack of total experience in mountain flying operations.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: MANEUVERING - TURN TO REVERSE DIRECTION

Findings
1. TERRAIN CONDITION - RISING
2. TERRAIN CONDITION - HIGH TERRAIN
3. WEATHER CONDITION - HIGH DENSITY ALTITUDE
4. AIRCRAFT PERFORMANCE,CLIMB CAPABILITY - EXCEEDED
5. (F) PLANNING/DECISION - INADEQUATE - PILOT IN COMMAND
6. (F) LACK OF TOTAL EXPERIENCE IN TYPE OPERATION - PILOT IN COMMAND
7. (C) ALTITUDE/CLEARANCE - INADEQUATE - PILOT IN COMMAND
8. MANEUVER - ATTEMPTED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

At an undetermined time between 1834 hours Pacific daylight time on April 24, 2000, and 1612 on April 25, 2000, a Cessna 152, N67435, operated by Aer Mistral, Inc., Fort Worth, Texas, collided with upsloping mountainous terrain while maneuvering about 29 nautical miles (nm) south of Austin, Nevada. Visual meteorological conditions existed in the central Nevada accident site area between April 24 and 25. The airplane was destroyed, and the two private pilots were fatally injured. The flight was performed under 14 CFR Part 91, and no flight plan was filed. The airplane's last observed departure point was from the uncontrolled Winnemucca Municipal Airport, Winnemucca, Nevada, on April 24, about 1655.

A line serviceman at Winnemucca indicated that he last observed the airplane after completely refilling its fuel tanks and it departed the airport. The airplane's route of flight to the accident site was determined from recorded data that was subsequently extracted from a global positioning satellite (GPS) receiver found in the airplane's wreckage. Additionally, photographic evidence showing the latter portion of the flight was obtained from two cameras also found in the wreckage.

In summary, the GPS data and photographic evidence indicated that after departing Winnemucca the airplane tracked along a southeasterly course until landing on an unidentified dry lakebed-like clearing that was devoid of vegetation. Both pilots exited the airplane and took pictures of each other. After an undetermined amount of time, the pilots took off and continued heading in a southeasterly direction (toward the accident site). The airplane entered a winding valley and the pilot(s) took additional pictures that showed the airplane within hundreds of feet of nearby rising, rocky, high mountainous terrain. As evident from the photographs, the airplane was flying below the level of nearby mountaintops. Snow-covered terrain was visible ahead of, and at a higher elevation, than the airplane.

The National Transportation Safety Board investigator noted that the final two aerial pictures recovered from the accident airplane show mountainous terrain that is consistent in appearance with the terrain leading to the accident site.

PERSONNEL INFORMATION

Left-Seated Pilot.

A review of the left-seated pilot's flight record logbook indicated that he commenced primary flight training at a Texas-based flight school on January 31, 2000, in a Cessna 152. He soloed on February 8, and he was issued a private pilot certificate on March 3. Upon certification, the

pilot's total dual cross-country flight training was 5.8 hours.

Thereafter, the pilot continued taking flying lessons. By April 16, the date of his last logged flight, the pilot's total dual cross-country and total flight time was 6.8 and 110.8 hours, respectively. All of the pilot's training flights were listed as having been flown in Texas.

Right-Seated Pilot.

A review of the right-seated pilot's flight record logbook indicated that he commenced primary flight training at the same Texas-based flight school on January 20, 2000, in a Cessna 152. He soloed on January 30, and he was also issued a private pilot certificate on March 3. Upon certification, the pilot's total dual cross-country flight training was 6.2 hours.

Thereafter, the pilot continued taking flying lessons. He was issued an instrument rating on April 17. By this date, his total dual cross-country and total flight time was 12.3 and about 134 hours, respectively. All of the pilot's training flights were listed as having been flown in Texas.

No evidence was found indicating that either of the pilots had received flight training in mountain flying or high density altitude operations. All of their flying experience was performed in Cessna 152 and 172 airplanes.

AIRCRAFT INFORMATION

The airplane was equipped with dual flight controls. It could be piloted from either the left or right seat location.

The airplane's last recorded empty weight was listed in 1988 at 1,138.9 pounds. Based upon the pilots' weights, the estimated weight of the observed baggage, and full fuel tanks, the calculated total (gross) weight of the airplane upon its departure from Winnemucca was about 1,679 pounds. The maximum certificated gross weight for operation of the airplane is 1,670 pounds.

The airplane's published service ceiling is 14,700 feet. Under standard atmospheric conditions, at sea level its maximum rate of climb is 715 feet per minute. At 8,000 feet (and about zero degrees Celsius) the maximum rate of climb is reduced to 380 feet per minute, at 62 knots indicated airspeed.

The airplane's logbooks were recovered and examined. A review of the airframe logbook indicates that the last recorded maintenance was a 100-hour inspection that was accomplished on April 12, 2000. On this date, the airplane's total time was listed as 10,502.9 hours.

A review of the engine logbook indicates that on April 12, 2000, the spark plugs were examined. Engine compression was listed between "76/80" and "78/80." The engine's time

since last major overhaul was 248.6 hours, and its total time in service was 4,705.2 hours. The engine's recording tachometer registered 1,834.9 hours.

The Safety Board investigator received a copy of Invoice No. 8549, dated April 17, 2000, from Andy Williams Aircraft, Meacham Field, Fort Worth, Texas. The invoice listed the following airplane information: C-152, N67435, and tachometer reading of 1,841.2 hours. The following squawk was listed on the respective "Aircraft Repair Order Instructions" portion of the invoice: "flap will not operate CB pops when master is turned on." The following corrective action was listed on the invoice: "oper ck - taped leads."

The Safety Board investigator telephonically interviewed the mechanic who indicated that he had performed the referenced repair. The mechanic stated that because the airplane's operator had not presented him with the airplane's logbooks, he was not able to record the maintenance he had recently performed prior to the time the airplane was rented for the subsequent accident flight. The mechanic further stated that the repair he had performed was minor, and it involved fixing chaffed electrical wires. Following his repair, the flaps were functionally tested and they were found to operate normally. No other maintenance discrepancy was noted with the airplane.

On April 17, 2000, a certified flight instructor and his student flew the airplane. The flight instructor reported that the wing flaps operated normally during their flight. No discrepancies were noted with the airplane. The engine's recording tachometer setting was noted in the rental record at the conclusion of the flight as being 1,842.1 hours.

The airplane's operator reported to the Safety Board investigator that the flight school then rented the airplane to the accident pilot(s) for their cross-country flight. The pilots planned to continue with their flight training, and they expressed a desire to rapidly increase their total flight experience by performing a long cross-country flight.

METEOROLOGICAL INFORMATION

Austin's weather observation station is located about 29 nm north of the accident site. Tonopah, Nevada's observation station is about 59 nm south of the site. Visual meteorological conditions existed at these facilities between April 24 and 25. In addition, there were no reports of convective activity or precipitation, the surface wind was less than 10 knots, and the prevailing visibility was between 25 and 50 miles.

AIDS TO NAVIGATION

According to the Federal Aviation Administration (FAA), all electronic aids to navigation pertinent to the aircraft's route of flight were functional.

COMMUNICATION

The FAA reported that a search of pertinent facilities did not reveal evidence that any radio communications to or from the pilots/airplane occurred following its departure from Winnemucca.

WRECKAGE AND IMPACT INFORMATION

The Safety Board investigator's on scene examination revealed the airplane impacted upsloping terrain, in the Toiyabe National Forest at global positioning satellite (GPS) coordinates of 39 degrees 02.562 minutes north latitude by 117 degrees 17.020 minutes west longitude. About 3 miles northwest of the accident site, near the Tierney Creek, the terrain's elevation is about 7,100 feet msl. About 1 mile southeast of the accident site the terrain rises to about 8,700 feet msl.

The airplane wreckage was observed adjacent to the initial point of impact ground scar, about 8,100 feet msl, and oriented on a magnetic heading of about 170 degrees. The airplane was in an east-to-west oriented valley, an estimated 100 feet above its floor. The site was between ridgelines having elevations over 250 feet higher than the point of impact. The airplane was in an upright, approximately 10 degrees right bank attitude, and the fuselage was oriented nearly perpendicular to the estimated 20-degree upsloping north face of a mountainside. A ground scar imprint, having approximately the same span as the wings, was observed about 8 feet forward of the wing's leading edge structure.

All wreckage was found within an estimated 40-foot radius of the main airplane structure. Components found separated from the main wreckage were the compass, Plexiglas windshield, doors, navigation light lenses, and small debris from the cabin. An impact-damaged handheld GPS receiver was found in the wreckage.

MEDICAL AND PATHOLOGICAL INFORMATION

Responding rescue personnel reported finding the two deceased pilots inside the airplane's cockpit. Autopsies were performed for the Nye County Sheriff/Coroner's Office, P.O. Box 831, Tonopah, Nevada, by the Washoe County Coroner's office, Nevada.

The FAA's Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma performed toxicology tests. No evidence of carbon monoxide, ethanol, or drugs was found in specimens of vitreous and blood from the pilots.

TESTS AND RESEARCH

Airframe and Engine Examination.

The airplane wreckage was examined on scene. The continuity of the flight control system was confirmed. The leading edge of the right wing was found crushed and accordioned in an aft direction. The left wing's leading edge was also deformed as evidenced by the presence of

diagonal buckles in its cambered surface. The tail was observed attached to the empennage. All of the flight control surfaces were found attached to the airframe. The cockpit floor was found crushed and displaced in an upward direction. The instrument panel was deformed and displaced in an aft direction.

The wing flap's activation jackscrew was observed undamaged. The flaps were noted fully retracted.

Fuel was observed in both wing fuel tanks. The right fuel tank was observed about 3/4-full, and the left tank was partially ruptured but contained an estimated 1 gallon of fuel. The carburetor's fuel filter inlet screen was devoid of foreign material. There was no evidence of fire.

The propeller assembly was found attached to the crankshaft. The blade's leading edge was nicked, and it was deformed into an "S" shape curl. Chordwise scratches were noted on one blade surface.

Upon rotation of the engine's crankshaft, both magnetos generated spark that was observed at sparkplug leads associated with each of the four cylinders. The examined spark plug electrodes appeared undamaged and exhibited a gray-to-brown coloration. Also during rotation of the crankshaft, thumb compression was felt in all cylinders, valve action was apparent, the vacuum pump's drive gear rotated, and the engine's internal mechanical continuity to the accessories was confirmed.

The engine's recording tachometer was noted registering 1,878.3 hours. The airplane's flight hour recording meter was observed registering 3,747.4 hours. A note found in the airplane wreckage indicated that the flight hour meter had registered 3,746.0 hours at Winnemucca.

Global Positioning Satellite Data.

On May 2, 2000, under Safety Board supervision, the Magellan Model 315 handheld GPS receiver, which was found in the wreckage, was examined at its manufacturer's facility, in San Dimas, California. Magellan's technical support supervisor reported that the receiver's case was observed impact damaged and the liquid crystal display (LCD) was broken. An external power supply was connected to the receiver and it was bench tested. The receiver was found internally functional.

Recoverable memory was downloaded and printed. In pertinent part, the supervisor reported that the receiver had the capacity to retain 20 predefined routes. The examination revealed that only one route was stored in memory, and that route was noted as being "Winmca" to "Tonpah," as noted by leg (waypoint) numbers 45 and 47 in the printout. (See the printout labeled GPS315_8.txt.)

The examination also revealed that the receiver had been operated with its automatic track

history function activated. This configuration permitted the receiver to record over 1,200 track points (latitude and longitude coordinates) as the receiver was moved in various directions with specific degrees of heading changes. A plot produced from the downloaded data revealed that the receiver had moved across the western United States. The route was generally westward from Texas to California, northward to Washington, and then southerly to Nevada where the route ended.

This track history was printed out in a document entitled GPS315_61.txt. The track points in the printout are sequential in their order. However, no date or time data was recoverable due to possible damage to the time clock circuit, according to Magellan's technical support supervisor.

The last track point recorded by the GPS receiver is listed on page 22 of the printout. It indicates that the receiver was at N39 degrees 03.041 minutes latitude, by W117 degrees 17.715 minutes longitude.

In summary, the latter portion of the extracted data revealed a series of progressive track points generally oriented in a southeasterly direction commencing near a user predefined route waypoint at Winnemucca, and terminating prior to reaching the second predefined waypoint near Tonopah, Nevada. The last two recorded track points corresponded to the receiver's location in a valley near where the airplane wreckage was subsequently found. The track points were about 2.93 and 1.48 nm, respectively, north-northwest of the accident site.

Photographic Data.

Two cameras containing film were found in the airplane's cockpit. The film was developed and several pertinent photographs were recovered and reviewed by the Safety Board investigator. In pertinent part, the following observations were made:

One of the impact-damaged cameras contained Kodak Advantix film. Four pictures were recovered from the film in this camera that appear related to the accident flight. In sequential order, negative frame number one shows one of the pilots standing in front of an airplane hangar at the Winnemucca Airport. Negative number two shows a picture of the accident airplane following its landing in a dirt clearing on level terrain. The clearing is totally devoid of vegetation. Rising mountainous terrain appears in the background. One of the pilots is sitting on the ground beside the airplane, which has its wing flaps extended. Negative number three shows a similar view to negative number two. However, it shows the other pilot sitting on the ground next to the airplane. Negative number four shows a view after becoming airborne. The aerial view shows the airplane's position relative to a nearby mountainside and valley. The airplane appears at a low altitude to the ground and is flying below the level of a mountaintop. The airplane appears headed up a valley and is flying toward rising terrain that is partially covered with snow.

The other camera contained Imation 35 millimeter-size film. The last five photographs in the

roll show events related to the accident flight. In sequential order, negative numbers 17 through 20 show views similar to negative numbers two and three in the aforementioned roll of film. Negative number 21 shows a forward-looking aerial view, from the right side window vantage point, in which a portion of the engine cowling is visible in the left side of the photograph. The view shows the airplane's position relative to a mountainside and valley. Similar to negative number four in the aforementioned roll of film, the picture shows the accident airplane flying at a low altitude and below the level of a mountaintop. The airplane appears headed up a valley and is flying toward rising terrain that is partially covered with snow.

Accident Time Calculation.

The earliest time that the airplane could have crashed is about 1834. This event time is based upon the following Safety Board investigator calculations: (1) The Winnemucca Municipal Airport witness reported that the airplane departed from Winnemucca about 1655; (2) The distance between Winnemucca and the accident site is about 114 nm; (3) A review of the flight track history of recorded GPS track points indicates that a nearly direct en route track was flown between Winnemucca and the accident site; (4) The Cessna's nominal ground speed under standard atmospheric conditions, with zero wind, at 8,000 feet, is 107 knots; (5) The minimum time required to land in the desert terrain area shown in the pilots' photographs, perform physiological relief, take photographs of each other, reboard the airplane and takeoff, is estimated at 15 minutes; and (6) The airplane's flight hour recording meter indicated 1.4 hours had elapsed since departing Winnemucca.

Other Accident Time Evidence.

A watch, belonging to one of the pilots, was reportedly found stopped at 1912, on the 24th. Another watch was found stopped at 1221, and it indicated the date was the 28th. According to the United States Air Force Rescue Coordination Center, the initial search-air-rescue (SAR) satellite location fix (first alert) of an emergency locator transmitter (ELT) signal in the accident site area was at 1612 on April 25.

ADDITIONAL INFORMATION

The airplane wreckage was released to the owner's assigned insurance adjuster on May 1, 2000. No parts were retained.

Pilot Information

Certificate:	Private	**Age:**	25,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	January 28, 2000
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	111 hours (Total, all aircraft), 93 hours (Total, this make and model), 47 hours (Pilot In Command, all aircraft), 111 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N67435
Model/Series:	152 152	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	15281833
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	April 12, 2000 100 hour	**Certified Max Gross Wt.:**	1670 lbs
Time Since Last Inspection:	43 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	10546 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	O-235-L2C
Registered Owner:	AER MISTRAL, INC.	**Rated Power:**	110 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KU3 ,6230 ft msl	**Distance from Accident Site:**	29 Nautical Miles
Observation Time:	18:40 Local	**Direction from Accident Site:**	4°
Lowest Cloud Condition:	Scattered / 20000 ft AGL	**Visibility**	30 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	WINNEMUCCA (WMC)	**Type of Flight Plan Filed:**	None
Destination:	LAS VEGAS	**Type of Clearance:**	None
Departure Time:	16:55 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	39.539455,-117.190696(est)

Administrative Information

Investigator In Charge (IIC):	Pollack, Wayne
Additional Participating Persons:	HARRY SMITH; RENO , NV JAMES THOMAS, JR.; WICHITA , KS MARK PLATT; VAN NUYS , CA
Original Publish Date:	November 1, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=49060

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.