National Transportation Safety Board
Aviation Accident Final Report

Location:	SEDONA, AZ	**Accident Number:**	LAX98FA050
Date & Time:	12/02/1997, 2200 MST	**Registration:**	N301JL
Aircraft:	Mooney M20J	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The area forecast was for VFR to MVFR conditions with occasional visibility reducing to 3 to 5 miles in mist. The 700 mb (10,000 feet MSL) Constant Pressure chart depicted Flagstaff as having northwesterly winds of approximately 25 knots. After checking the weather several times, the pilot departed Sedona (elevation 4,827 feet). No flight plan had been filed for the 21 mile northbound flight to Flagstaff. Dark night conditions existed at the time of the accident and there were no ground lights in the direction of flight. After takeoff, the northbound aircraft struck the leeward side of a 6,100-foot ridge, about the 5,952-foot level, and at a point located along a direct route to Flagstaff. The crash site was located bearing 019 degrees and 4.3 miles from the Sedona airport. Given the wind and mountainous terrain in the area of the accident, the influence of such winds would result in downslope wind conditions over the accident site.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the failure of the pilot to maintain adequate terrain clearance during the climb. Contributing factors were dark night conditions, mountainous/hilly terrain, and mountain wave weather conditions.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: CLIMB

Findings
1. (F) LIGHT CONDITION - DARK NIGHT
2. (F) WEATHER CONDITION - MOUNTAIN WAVE
3. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
4. (C) ALTITUDE/CLEARANCE - INADEQUATE - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On December 2, 1997, about 2200 hours mountain standard time, a Mooney M20J, N301JL, en route to Flagstaff, Arizona, collided with mountainous terrain after takeoff from the Sedona, Arizona, airport. The aircraft was destroyed and the pilot and his passenger received fatal injuries. The aircraft was being operated by the pilot/owner as a personal flight under 14 CFR Part 91 of the Federal Aviation Regulations when the accident occurred. The flight originated about 2158. Visual meteorological conditions prevailed at the time and no flight plan was filed.

An unidentified transient pilot reported to the airport manager that he had heard an aircraft climbing out about 2200 on December 2, 1997. There were no other witnesses identified.

There were no ground-based lighting systems in the vicinity of the accident site.

The wreckage was spotted about 0835 the next morning by a resident with a telescope who subsequently reported it to the Sedona Fire Department.

According to Federal Aviation Administration (FAA) records, the pilot did not receive a weather briefing.

PILOT INFORMATION

No pilot logbooks were available for review by investigators.

AIRCRAFT INFORMATION

The aircraft was equipped with an S-Tech model 0110 autopilot and a Bendix/King model KLN 90B GPS navigational system. There was no retrievable memory available from either system.

Sheriff's deputies reported that the aircraft logbooks were given to an FAA inspector who made copies of selected entries. The inspector reported that, according to the logbook entries, the aircraft was being maintained in an airworthy condition. The sheriff reported that the logbooks were signed out of the evidence locker on December 17, 1997, by a person identified as the son of the pilot.

The aircraft logbooks were discarded by the pilot/owner's son after he received them from sheriff's deputies and before they could be reviewed by Safety Board investigators. The FAA inspector did not retain the logbook copies he had made on the day of the accident.

The date, location, and amount of the last fuel purchase are unknown.

There was no evidence found to indicate that the aircraft was beyond gross weight or center of gravity limitations.

METEORLOGICAL CONDITIONS

The area forecast for December 3, 1997, at 1145Z was for VFR to MVFR conditions with occasional visibility down to 3 to 5 miles in mist.

The 700 mb Constant Pressure chart for December 3, 1997, at 1200Z depicted the Flagstaff station model. The indications were northwesterly winds of approximately 25 knots, a temperature of -9 degrees Celsius, and a dew point of -10 degrees Celsius at 10,000 feet msl.

There was no moon illumination at the estimated time of the accident.

There was no FAA record of the pilot receiving a weather briefing, although friends of the pilot reported that he had checked the weather several times before departing.

WRECKAGE AND IMPACT INFORMATION

The accident site was located on the south side of an approximate 6,100-foot east-west ridge, at about 5,952 feet msl. A GPS indicated the position was 34 degrees 54 minutes 18.9 seconds north latitude and 111 degrees 44 minutes 17.9 seconds west longitude.

The accident site was on a 019-degree bearing, 4.3 miles from the Sedona airport. The runway is oriented toward 03 and 21. The Flagstaff airport is located on a 003-degree bearing, 21 miles from the Sedona airport.

An examination of the aircraft revealed that the right wing was separated, at the root, from the fuselage. The right wing exhibited more leading edge crushing than did the leading edge of the left wing. Control continuity was established to all flight control surfaces. The nose of the aircraft was crushed aft to within 14 inches of the leading edge of the remaining wing. The instrument panel was positioned in proximity to the back of the front seats. There was evidence of oil-canning on the top and sides of the main fuselage.

The engine initially was found at the accident site shifted aft and separated from the airframe engine mounts. There was evidence of impact damage on both the engine and engine accessories. The oil sump/plenum with the attached fuel control servo was separated from the engine, as were the engine accessory case, magneto, fuel pump, vacuum pump, and propeller governor.

An attempt to rotate the crankshaft by hand was unsuccessful. There was a gouge across the No. 1 cylinder barrel that was consistent in size and orientation to that of a propeller blade. The piston faces were viewed, with the aid of a penlight, through the spark plug holes and appeared undamaged. The rocker covers were removed and the valve components were visually inspected. The connecting rods and crankshaft at the No. 3 and 4 cylinder positions were viewed through a hole in the rear of the engine case. There was no evidence of mechanical malfunction visible. The idler gears were missing from the accessory case and were not recovered from the site. The crankshaft gear and dowel were secure and intact.

There was no evidence of metal contamination in the engine oil. The oil pump was intact and contained residual oil.

The vacuum pump drive was intact; however, the vanes were found cracked and shattered.

Half of the 8 spark plug electrodes, 1 per cylinder, were undamaged. According to the Champion Spark Plugs Check-A-Plug chart, AV-27, the undamaged electrodes displayed wear and coloration patterns consistent with normal operation.

The single drive dual magneto could not be functionally tested due to damage. The impulse coupler drive was intact and secure on the shaft.

The fuel injection servo fuel flow divider was intact and secure at its mounting bracket. Line continuity was established to each cylinder nozzle. The No. 3 nozzle was separated. The flow divider was disassembled and trace amounts of a fuel-like substance were noted.

The engine driven fuel pump was disassembled and examined. There was no evidence of internal blockage or mechanical malfunction.

The exhaust system gas path coloration was light gray. There was no evidence of internal obstructions when viewed through the ports of each pipe.

The two-bladed constant speed propeller was separated from the engine crankshaft. A portion of the propeller hub remained attached to the propeller flange. Both propeller blades' tips, though fractured, were found at the accident site. The blades exhibited leading edge damage as well as chordwise scouring.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was conducted on December 4, 1997, by the Coconino Medical Examiner, with specimens retained for toxicological examination. The toxicological test results were negative for alcohol and all screened drug substances.

TESTS AND RESEARCH

The direct flight time from takeoff to impact was estimated by Safety Board investigators and the aircraft manufacturer's representative to have been approximately 3.0 minutes. This was based on an average rate of climb of 980 fpm, an estimated gross weight of 2,517 pounds, surface winds from 130 degrees at 4 knots, a surface temperature of 43 degrees Fahrenheit, and an initial field elevation of 4,827 feet msl. Under the stated conditions, the expected altitude gain would have been about 2,940 feet, or 7,767 feet msl. These computations did not account for the potential effect of mountain wave conditions. That altitude is 571 feet above the highest terrain depicted on the 60th edition of the Phoenix Sectional Aeronautical Chart, for the direct route of flight between Sedona and Flagstaff.

ADDITIONAL INFORMATION

The ELT activated when slapped against the palm of the hand.

The aircraft wreckage was released to a representative of the registered owner on May 4, 1999.

Pilot Information

Certificate:	Flight Instructor; Commercial	**Age:**	52, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	08/29/1997
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	3022 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N301JL
Model/Series:	M20J M20J	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	24-0649
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	2740 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1942 Hours	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-360-A3B6D
Registered Owner:	LAWRENCE JOHN GARNELLO	**Rated Power:**	200 hp
Operator:	LAWRENCE JOHN GARNELLO	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	SEZ, 4827 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	2201 MST	**Direction from Accident Site:**	208°
Lowest Cloud Condition:	Unknown / 0 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	Broken / 5000 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	130°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	6°C / 5°C
Precipitation and Obscuration:			
Departure Point:	(SEZ)	**Type of Flight Plan Filed:**	None
Destination:	FLAGSTAFF, AZ (FLG)	**Type of Clearance:**	None
Departure Time:	2158 MST	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	ROBERT R CRISPIN	**Report Date:**	12/08/1999
Additional Participating Persons:	WILLIAM A PRATT; SCOTTSDALE, AZ MARK W PLATT; VAN NUYS, CA		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		