National Transportation Safety Board
Aviation Accident Final Report

Location:	Marshall, AK	**Accident Number:**	ANC03LA007
Date & Time:	10/28/2002, 2000 AST	**Registration:**	N91090
Aircraft:	Cessna 207	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The commercial pilot was positioning the airplane from the departure airport to another airport. The flight took place on a dark night with overcast skies, and no discernible horizon. The pilot departed and climbed to a cruise altitude between 1,200 and 1,400 feet msl. About 4 miles south of the departure airport, the airplane collided with an east-west ridge at 1,200 feet msl. The ridgeline is perpendicular to the direct route of flight between the departure and destination airports, and rises from west to east with a summit elevation of 1,714 feet msl. The departure airport was a newly commissioned airport 3 miles east-northeast of the old airport. The accident flight was the pilot's second trip to the new airport, and his first night departure from either the old or new airport. Direct flight from the new airport to the destination airport requires a higher altitude to clear the ridgeline than does a direct flight from the old airport. A direct flight from the old airport crosses the same ridgeline farther to the west, where the elevation of the ridge is less than 500 feet msl.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain clearance from terrain, which resulted in an in-flight collision with a ridgeline. Factors contributing to the accident were the high terrain, the pilot's inadequate preflight planning, and the dark night light conditions.

Findings

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

Findings
1. (F) LIGHT CONDITION - DARK NIGHT
2. (F) TERRAIN CONDITION - HIGH TERRAIN
3. (C) CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
4. (F) PREFLIGHT PLANNING/PREPARATION - INADEQUATE - PILOT IN COMMAND

Factual Information

On October 28, 2002, about 2000 Alaska standard time, a Cessna 207 airplane, N91090, sustained substantial damage when it collided with terrain during cruise flight, about four miles southeast of Marshall, Alaska. The airplane was being operated by Grant Aviation Inc., Anchorage, Alaska, as a visual flight rules (VFR) positioning flight under Title 14, CFR Part 91, at the time of the accident. The solo commercial pilot received serious injuries. Night visual meteorological conditions prevailed, and company flight following procedures were in effect. The flight originated at the Marshall Airport about 1955, and was bound for Bethel, Alaska.

The accident airplane departed the 'new' Marshall airport (MLL). The 'old' Marshall airport (MLL) was decommissioned several days earlier. The new airport is 3 miles east-northeast of the old airport, and was not yet depicted on current navigation charts, nor listed in the current United States Government Flight Information Publication, Alaska Supplement.

When the flight failed to arrive at Bethel, a search was initiated. On October 29, about 0100, search personnel located the wreckage about 4 miles southeast of Marshall. The airplane was located about 1,200 feet msl, on the north side of a ridgeline that runs generally east to west. The ridge has a summit elevation of 1,714 feet msl.

The airplane was equipped with Capstone navigation and terrain avoidance avionics. The Capstone equipment uses GPS mapping technology and aircraft position information, in conjunction with a multifunction display in the instrument panel, to graphically represent the aircraft's position relative to terrain. Terrain that comes within set parameters for altitude and horizontal distance is displayed in color bands. Terrain depicted within the red color band is intended to warn the pilot of the close proximity of terrain to the aircraft.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on November 4, the pilot said he departed Marshall on runway 07, and made a climbing right turn at 80 knots indicated airspeed toward Bethel. He said the vertical speed indicator read in excess of 1,000 feet per minute rate of climb, that it was a very dark night, and there were no visible horizon or ground references discernible. He said his route was direct to Bethel at 1,200 to 1,400 feet msl, and that upon reaching his cruise altitude, there was a strong headwind and turbulence. He said just prior to impacting the terrain, his vertical speed indicator showed a high rate of descent, and his Capstone display was almost completely red. He further stated the airplane's GPS had not been reprogrammed to reflect the location changes for the old Marshall airport and the new Marshall airport. The pilot said he had made one flight into the old Marshall airport, and this was his second flight into the new Marshall airport. This was the first flight when he departed either airport after dark. He said there were no preimpact mechanical anomalies with the airplane.

Direct flight from either Marshall airport to Bethel requires crossing an east-west ridgeline on the north side of the Yukon River. The direct route from the old Marshall airport to Bethel crosses the western foot of the ridgeline at a point with an elevation of less than 500 feet msl. The direct route from the new airport to Bethel crosses the ridge at a point where the elevation of the ridge exceeds 1,200 feet msl.

During a telephone conversation with the NTSB IIC on November 6, the pilot of the Army helicopter that located the accident airplane said their initial attempts to locate the missing airplane were futile. He said they then flew to the new Marshall airport and attempted to

recreate the accident flight by taking off into the wind, conducting a right down wind departure replicating the performance of the Cessna 207, and heading direct to Bethel. He said when they reached the ridgeline on the north side of the Yukon River they headed east up the ridge toward the summit (1,704 msl). They located the accident airplane within minutes at 1,200 feet msl. He said the airplane impacted near the crest of the ridge, with a shallow angle of attack. He also stated that all the major airframe components sustained substantial damage, and the engine had separated from the airplane. The helicopter pilot said after they landed he noted that the wind was strong out of the northeast, with gusts above 40 knots. He said during the time they were searching for the accident airplane they did not encounter turbulence.

The weather forecast for the Yukon/Kuskokwim Delta area at the time of the accident was scattered clouds at 3,500 feet msl, occasional broken clouds at 3,500 to 6,000 feet msl, with an outlook for VFR and windy conditions. The freezing level was at 1,500 feet msl, and no turbulence was forecast.

During the accident sequence the emergency locator transmitter (ELT) did not activate. The injured pilot removed the ELT from its holder, and took it with him into the empennage where he sheltered himself from the weather. He was not aware the ELT was not transmitting. Rescue personnel recovered the pilot and the ELT. The ELT was released to the operator who proceeded to functionally test the ELT until it activated. It is unknown why the ELT did not operate upon impact.

Pilot Information

Certificate:	Flight Instructor; Commercial	**Age:**	30, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	07/15/2002
Occupational Pilot:		**Last Flight Review or Equivalent:**	10/05/2002
Flight Time:	1745 hours (Total, all aircraft), 115 hours (Total, this make and model), 1500 hours (Pilot In Command, all aircraft), 75 hours (Last 90 days, all aircraft), 56 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N91090
Model/Series:	207	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	20700069
Landing Gear Type:	Tricycle	**Seats:**	7
Date/Type of Last Inspection:	10/02/2002, 100 Hour	**Certified Max Gross Wt.:**	3800 lbs
Time Since Last Inspection:	92.3 Hours	**Engines:**	1 Reciprocating
Airframe Total Time:	14551 Hours at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-520-F
Registered Owner:	GRANT AVIATION INC	**Rated Power:**	300 hp
Operator:	GRANT AVIATION INC	**Operating Certificate(s) Held:**	Commuter Air Carrier (135); On-demand Air Taxi (135)
Operator Does Business As:	Grant Aviation Inc.	**Operator Designator Code:**	ENHA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	15 knots / 24 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	40°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.34 inches Hg	**Temperature/Dew Point:**	2°C / -1°C
Precipitation and Obscuration:			
Departure Point:	Marshall, AK (MLL)	**Type of Flight Plan Filed:**	Company VFR
Destination:	Bethel, AK (BET)	**Type of Clearance:**	None
Departure Time:	1955 AST	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	61.815556, -162.012500

Administrative Information

Investigator In Charge (IIC):	Lawrence R Lewis	**Report Date:**	04/18/2003
Additional Participating Persons:	Stanley E Bernard; Anchorage FSDO-03; Anchorage, AK		
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/.		