National Transportation Safety Board
Aviation Accident Final Report

Location:	CASPER, WY	**Accident Number:**	SEA93FA088
Date & Time:	04/06/1993, 0435 MDT	**Registration:**	N96JP
Aircraft:	MITSUBISHI MU-2B-35	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

THE AIRCRAFT WAS ON AN AIR AMBULANCE (EMS) FLIGHT AND WAS CLEARED FOR THE ILS RUNWAY 8 APPROACH AT CASPER, WY. RADAR DATA SHOWED THE AIRCRAFT TRACKING AND DESCENDING NORMALLY ON THE DME ARC, UNTIL IT WAS BELOW RADAR COVERAGE FOR THE AREA. SUBSEQUENTLY, IT COLLIDED WITH THE TOP OF A RIDGE, ALONG THE LOCALIZER CENTERLINE, BEFORE REACHING THE OUTER MARKER, ABOUT 8 MILES FROM THE AIRPORT. ELEVATION OF THE CRASH SITE WAS ABOUT 5800 FEET; MINIMUM DESCENT ALTITUDE BEFORE INTERCEPTING THE ILS GLIDE SLOPE WAS 7100 FEET; CROSSING ALTITUDE AT THE OUTER MARKER WAS 6700 FEET.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: FAILURE OF THE PILOT TO MAINTAIN PROPER ALTITUDE DURING THE NIGHT IFR APPROACH IN INSTRUMENT METEOROLOGICAL CONDITIONS (IMC).

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH - IAF TO FAF/OUTER MARKER (IFR)

Findings
1. LIGHT CONDITION - DARK NIGHT
2. WEATHER CONDITION - LOW CEILING
3. WEATHER CONDITION - SNOW
4. (C) PROPER ALTITUDE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On April 6, 1993, approximately 0435 mountain daylight time, a Mitsubishi MU-2B-35, N96JP, was destroyed when it collided with terrain approximately eight and one half miles west of the Casper, Wyoming, airport. The Airline Transport Pilot, two medical technicians, and a cardiac patient were fatally injured in the accident. The air ambulance flight, to be conducted under 14 CFR 135, had departed Riverton, Wyoming, at 0409, according to Wyoming Medical Center dispatch records. The flight was under an instrument flight rules flight plan. Instrument meteorological conditions prevailed at Casper at the time of the accident. The ELT functioned and was used to locate the wreckage, which burned after impact.

The pilot of the air ambulance flight had worked during office hours at administrative functions for his employer on April 5, 1993. According to Wyoming Medical Center records, Wyoming Life Flight received notification at 0046, April 6, 1993, of a patient at Riverton, Wyoming, in a state of post-cardiac arrest care, who required transport to the Wyoming Medical Center. Because the Life Flight helicopter was grounded due to weather, Casper Air Service was notified at 0050. The pilot advised that the fixed wing aircraft would be available by 0145. At 0105, the pilot called Casper FSS by telephone, obtaining an abbreviated weather briefing and filed two IFR flight plans, to and from Riverton. At 0203, the pilot contacted FSS by radio, received a Casper airport advisory and picked up an IFR clearance to Riverton. The pilot did not cancel his IFR flight plan when he arrived at Riverton, but was tracked down and closed it later while waiting at the airport.

At 0338, the Riverton ambulance service picked up the patient, arriving at the airport at 0346, then reported back in service at 0356. An eight minute cellular phone call to the Wyoming Medical Center, starting at 0402, was made with a cellular telephone found in the wreckage. A return flight lift off time of 0409 was logged by Wyoming Life Flight. At 0411, the pilot contacted ATC requesting an IFR clearance from Riverton, WY to Casper, WY. The pilot was issued a clearance to Casper, as filed, to maintain 15000 feet. At 0412, N96JP was radar identified and the pilot reported leaving 9400 feet.

At 0421, the flight was handed off to Denver ARTCC. At 0422:09, the pilot reported level at 15000 to Denver Center. Denver ARTCC acknowledged. At 0422:23, Center issued a descent clearance to 13000 feet and issued an altimeter setting of 29.66. At 0422:34, the pilot of N96JP read back the altimeter setting and the descent altitude of 13000 feet. At 0422:54, Center provided the pilot with current Casper weather: a 1006 special observation with sky partially obscured, measured 400 feet overcast, visibility 3/4 of a mile with light snow, with winds 010 at 12, altimeter 29.66.

At 0423:14, the pilot read back the altimeter setting, "and sky obscured three quarters and light snow, zero one zero and ah would like ah ILS eight."

At 0426:25, Center cleared 96JP to maintain 11000 feet until established on the approach, and cleared him for the ILS runway 8 approach to the Casper airport. The pilot acknowledged and confirmed the descent clearance to 11000.

At 0432:22, Center terminated radar service and approved a change to advisory frequency, and requested that the pilot report his down time to Casper radio. At 0432:29, the pilot responded with "Juliet pop, thank you."

At 0434, the pilot contacted Casper Flight Service Station on radio, reporting inbound to Casper on an ILS approach for runway 8, requested, and received a local Airport Advisory. There were no further communications with the aircraft.

According to radar data, the pilot cruised at 270 knots ground speed, then slowed to about 230 knots while descending to 11000 feet until N96JP was established on the 22 DME arc of the Muddy Mountain VORTAC. After turning southbound on the arc, the pilot descended to 9700 feet MSL at an average descent rate of about 1400 feet per minute, and a ground speed as low as 160 knots. The descent continued until the last radar target (at 0432:08), at an average rate of descent from 9700 feet MSL to 8600 feet of about 1700 feet per minute, and a ground speed that had increased to 210 knots.

The wreckage was found near the top and on both sides of a ridge, at a GPS fix of 42 54.34 latitude, 106 39.27 longitude, at approximately 5800 feet MSL. GPS readouts indicated that the accident site was 20.20 miles from DDY (Muddy Mountain) VORTAC, and 8.62 miles and 77 degrees magnetic to the runway. This location was approximately on the centerline of the localizer for runway 8 at Casper.

PERSONNEL INFORMATION

The pilot's flight experience was extracted from company records, including a US Forest Service contract pilot's form. The pilot had 205 hours time in this make and model of aircraft, 205 hours actual instrument, and 20 hours simulated instrument time. On February 1, 1993, he satisfactorily completed a FAA FAR 135 competency/proficiency check conducted by an FAA inspector, satisfactorily demonstrating current knowledge and competency in the MU-2B aircraft, including ILS approaches. Company FAR 135 records show that he flew 247.9 hours in calendar year 1992, and had flown 22.9 hours in January 1993, 14.2 hours in February 1993, and 19.6 hours in March 1993. No Flight and Duty time sheet was located for April 1993. Company records indicated that the last time the pilot flew prior to the accident was a trip of March 30 and 31, 1993, when he flew a Cessna 340 for a total of 5.8 hours.

AIRCRAFT INFORMATION

The aircraft was configured with seating for a crew of two, three passenger seats, and a stretcher. A recent equipment list indicated that it had the following autopilot, navigational, and communications equipment:

NAV-1 Collins VIR-30 NAV-2 King KNR660A RNAV Collins ANS-31 ADF King KDF-800 GS/MKR King KGM-690 COMMS King KTR-900 AUTOPILOT Collins FCS-105 FLIGHT DIR. Collins FCS-105 ALT ALERTER AM275C ATT. GYROS Collins 332DLL. Bendix Air driven COMPASS Collins 332E-4 and Bendix SG832 System

RADAR ALT Collins ALT-50 GPWS Sunstrand

Medical equipment included:

Aerosled II patient loading utility system with: Two 124 cubic foot oxygen with "diss outlet" One compressed air system with "diss outlet" One vacuum pump with "diss outlet" One 1000W inverter One gas equipment rail

METEOROLOGICAL INFORMATION:

A meteorological study was conducted for this flight by NTSB specialists and is attached.

WRECKAGE AND IMPACT INFORMATION

The initial impact point was a few feet below the summit of a long barren ridgeline with a northwest to southeast orientation. The left and right wings, powerplants, and propellers were found at the initial impact point, on the side of a 40-50 degree slope.

The empennage and fuselage, including the aft avionics bay and portions of the cockpit instrumentation, were found downslope, about 126 feet from the wings. The left wing tip tank was between the wings and fuselage, on the slope. The nose landing gear was on the northeast side of the ridge, 199 feet from the wings. The radome and nose cone were on the northeast side of the ridge, 183 feet from the wings. The right wing tip tank was also found on the opposite side of the ridge from the initial impact point.

The wings and powerplants were partially consumed by fire, and the remaining fuselage components had post-crash fire damage. The empennage and the tailcone were partially separated from the fuselage at a bulkhead. The tips of each empennage stabilizer and control surface were damaged. The rudder trim tab was essentially in trail, and the elevator trim tabs were about fifteen degrees down.

The right wing was at the top of the ridgeline, with its tip overhanging on the other side of the ridge. Its root section was destroyed by fire and the entire wing exhibited extensive fire damage. The right engine nacelle and cowling were fire damaged and exhibited crushing damage. The left wing was downslope of the right wing, and also exhibited extensive fire damage and destruction of its root section by fire. The left engine and cowling exhibited crushing and fire damage.

The nose of the right wing tip fuel tank was crushed with impact damage with an approximate 45 degree crush angle, and had longitudinal scrapes and crushing on its bottom surface. The nose of the left wing tip fuel tank was similarly crushed and torn, but it did not exhibit pronounced scrapes and crushing on its bottom surface.

Both vertical speed indicators were found at the accident scene. One indicated a descent of about 1400 feet per minute; the other indicated 6000 feet per minute climb. A Bendix attitude gyro and a Collins flight director indicator were found at the scene. One altimeter, from the copilot's instrument cluster, was found, which indicated approximately 6380 feet, with a Kollsman setting of 30.70. The second altimeter was not recovered. The cabin altitude/differential pressure gauge was also recovered, with indications of 3 psi, and 4250 feet. Fuel gauges indicated 400 pounds on each tip tank, and about 1100-1200 pounds on the main fuel tank. Both RMI's were found, with indications of headings of about 050 degrees, and with the surviving RMI double needle of one indicating 030 degrees. The captain's ADI and HSI were recovered and later tested.

MEDICAL AND PATHOLOGICAL INFORMATION

FAA toxicological testing detected ethanol in blood and lung fluid, but the laboratory noted that the "specimens are putrefied and the ethanol found in this case may be the result of postmortem ethanol production." Wyoming Chemical Testing Laboratory tested a separate set of specimens which were judged to be nonputrified.

An autopsy was performed by James W. Thorpen, MD, Natrona County Coroner, Casper, Wyoming. In his report, Dr. Thorpen noted the FAA toxicological testing results, and noted the following results from the Wyoming Chemical Testing Laboratory nonputrified specimens:

postmortem blood and vitreous alcohol determination negative, drug screen on blood negative. Dr. Thorpen listed the cause of death to be traumatic injuries, multiple, severe, extreme; with dismemberment and postmortem burning.

TESTS AND RESEARCH

The 22 nautical mile DME arc from Muddy Mountain VORTAC radial 341 to ILS runway 8 final approach course intercept and the ILS runway 8 final approach course to the runway threshold were subjected to flight inspection the morning following the accident, and were determined to be within tolerances at that time.

The two powerplants were subjected to teardown and inspection at the factory facility in Phoenix, Arizona. Both engines evidenced the following conditions:

1) Rotational scoring of the propeller shafts with corresponding sun gear rubs.

2) Damaged hub-to-ring-gear retainers.

3) Fractured or elongated planetary gear carrier mounting lugs with bent alignment pins.

4) Scored torque sensor housings.

5) FOD to the first stage compressor impeller blades.

6) First stage compressor impeller blades bent opposite to the direction of rotation.

7) Compressor impeller blade contour rubs with corresponding impeller shroud rubs.

8) Compressor-shroud metal spray deposits on the exit radius of the second stage compressor shroud, on the second and third stage turbine rotor and stators, and on the first-stage turbine stator.

9) FOD to the second-stage turbine rotor blades.

10) Sheared torsion shafts.

The captain's ADI (attitude deviation indicator) and HSI (horizontal situation indicator) were inspected at Collins' Seattle Service Center. It was determined that the ADI Mode Select switch was in the off mode, and the command bars were in the full up position (their bias is to be out of view/full up when in the off mode). During the course of the inspection, the pitch attitude tape, which had sustained burn masking, was removed and compared to a similar undamaged pitch attitude tape. The comparison indicated that the roll attitude index was at about 7 degrees starboard wing down. Meter positions of GS DEV at zero, LOC DEV at full left, and RAD ALT missing, were noted. On the HSI, azimuth was at approximately 52-53 degrees, HDG SEL was at approximately 58-59 degrees. CRS SEL was at approximately 75 degrees. The course counter was damaged. The DME display indicated 000 miles. The GS DEV meter was free, but settled at 2 dots down. The LOC DEV meter was at full right deflection.

The copilot's altimeter was disassembled at a Seattle instrument repair facility. It had sustained internal damage, but it was determined that the Kollsman setting of 30.70 did not appear to have been displaced or shifted from that setting.

ADDITIONAL DATA/INFORMATION

The wreckage was released to the insurance company's representative on November 23, 1993. It remained at Beagle's Aircraft Salvage at Greeley, Colorado.

Pilot Information

Certificate:	Airline Transport; Flight Instructor	**Age:**	51, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Helicopter	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	04/01/1993
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	12360 hours (Total, all aircraft), 205 hours (Total, this make and model), 12000 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 18 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	MITSUBISHI	**Registration:**	N96JP
Model/Series:	MU-2B-35 MU-2B-35	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	556
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	08/12/1992, 100 Hour	**Certified Max Gross Wt.:**	10800 lbs
Time Since Last Inspection:	61 Hours	**Engines:**	2 Turbo Prop
Airframe Total Time:	4781 Hours	**Engine Manufacturer:**	GARRETT
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	TPE 331-6-252
Registered Owner:	CASPER AIR SERVICE	**Rated Power:**	724 hp
Operator:	CASPER AIR SERVICE	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	CBCA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	CPR, 5348 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	0406 MDT	**Direction from Accident Site:**	80°
Lowest Cloud Condition:	Partial Obscuration / 0 ft agl	**Visibility**	0.75 Miles
Lowest Ceiling:	Overcast / 400 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	10°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	
Precipitation and Obscuration:			
Departure Point:	RIVERTON, WY (RIW)	**Type of Flight Plan Filed:**	IFR
Destination:	, WY (CPR)	**Type of Clearance:**	IFR
Departure Time:	0405 MDT	**Type of Airspace:**	Class E

Airport Information

Airport:	NATRONA COUNTY INT'L (CPR)	**Runway Surface Type:**	Asphalt
Airport Elevation:	5348 ft	**Runway Surface Condition:**	Slush covered; Snow--wet
Runway Used:	8	**IFR Approach:**	ILS
Runway Length/Width:	8679 ft / 150 ft	**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	3 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	MICHAEL L STOCKHILL	**Report Date:**	08/30/1994
Additional Participating Persons:	DAVE SOUCI; DENVER, CO PETER B BAKER; PHOENIX, AZ RALPH SORRELLS; DALLAS, TX DON KNUDSEN; WICHITA, KS		
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/.		