



National Transportation Safety Board Aviation Accident Final Report

Location:	WEBSTER, WI	Accident Number:	CHI94FA001
Date & Time:	10/02/1993, 1110 CDT	Registration:	N4421D
Aircraft:	BEECH G35	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal

Flight Conducted Under: Part 91: General Aviation - Personal

Analysis

RADAR DATA SHOWED THE AIRPLANE WAS CRUISING AT ABOUT 7500' MSL & 190 KTS GROUND SPEED & TRACKING ABOUT 140 DEGREES, WHEN IT BEGAN TO DESCEND. THE LAST RECORDED ALTITUDE WAS ABOUT 6500' MSL. WITNESSES HEARD A LOUD NOISE, THEN SAW THE AIRPLANE & DEBRIS FROM THE PLANE FALLING TO THE GROUND. THEY WERE UNABLE TO JUDGE THE AIRPLANE'S ALTITUDE WHEN IT BROKE UP. WRECKAGE WAS SCATTERED OVER A DISTANCE OF ABOUT 1.3 MILES. AN EXAM REVEALED THE V-TAIL STABILIZERS & WINGS HAD SEPARATED IN FLIGHT. THERE WAS EVIDENCE THE STABILIZERS HAD FAILED IN A DOWNWARD DIRECTION. THE RIGHT WING SEPARATED FROM THE FUSELAGE AT THE WING ROOT, & THE LEFT WING HAD SEPARATED IN 3 MAIN PIECES; THERE WAS EVIDENCE ON THE FRONT SPAR CARRY-THROUGH STRUCTURE THAT THE WINGS HAD FAILED IN A DOWNWARD DIRECTION. BOTH FRONT SEAT BELTS WERE INTACT, BUT UNLATCHED, WITH NO EVIDENCE OF DEFORMATION; THE PILOT WAS THROWN FROM THE AIRPLANE DURING THE ACCIDENT. NO PRE-ACCIDENT ANOMALIES OF THE AIRFRAME WERE FOUND.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: IN-FLIGHT BREAKUP OF THE AIRPLANE FOR AN UNDETERMINED REASON.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: DESCENT

Findings

1. (C) REASON FOR OCCURRENCE UNDETERMINED
2. V-TAIL STABILIZER - OVERLOAD
3. V-TAIL STABILIZER - SEPARATION
4. WING - OVERLOAD
5. WING - SEPARATION
6. SEAT BELT - NOT USED - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On October 2, 1993, at 1110 central daylight time, a Beech G35, N4421D, registered to Bimidji Aviation Services, Inc. of Bimidji, Minnesota, and operated by an Airline Transport Rated pilot with commercial privileges for single engine land and sea planes, experienced a general disintegration of the airframe during cruise flight, near Webster, Wisconsin. The airplane was destroyed. The pilot sustained fatal injuries. The personal 14 CFR Part 91 flight was operating in visual meteorological conditions. No flight plan was on file. The flight departed Bimidji, Minnesota, at 1025, with the intended destination of Rice Lake, Wisconsin.

An eye witness stated that his attention was drawn to the airplane by the sound of the engine. To him, the airplane appeared to be in level flight and he watched the airplane for several seconds noting nothing unusual. He then directed his attention away from the airplane after which he heard what he described to be an "explosion." He redirected his attention to the airplane; however found it to be obscured from his view by trees. The witness' wife was about 100 yards away from him. She related that she did not see the airplane prior to the "explosion;" however, her attention was directed toward the noise and she saw parts falling out of the sky.

Two other witnesses who were working together stated that their attention was directed to what they assumed was an approaching airplane from the engine sounds. They stated that they looked skyward, but did not immediately see an airplane. They then heard a loud noise and said they saw what they thought to be a cloud of debris from which parts of the airplane emerged headed toward them. They watched for a few seconds and decided that they should seek cover. They then directed their attention away from the airplane.

PERSONAL INFORMATION

The pilot, born November 8, 1954, was the holder of pilot certificate number 398444652, with privileges of Airline Transport Pilot, airplane multi-engine land, and commercial pilot single engine land and sea. He was also the holder of a flight instructor rating for airplane multi-engine and single engine and instrument airplane. He held a first class medical certificate issued July 7, 1993, with the restriction: "Must wear corrective lenses." He indicated that he had accumulated a total of 3,900 hours total pilot time at the time of his last medical examination. No personal log books were located for the pilot.

AIRCRAFT INFORMATION

The airplane was a Beech G35, N4421D, serial number D-4574. At the time of the accident the airframe had accumulated 7,510 hours time in service; the engine 451 hours since the last major overhaul. The airplane received an annual inspection on April 20, 1993. The airplane had accumulated 82 hours since the last inspection.

METEOROLOGICAL INFORMATION

The nearest weather reporting station to the accident, Duluth, Minnesota, reported 4,500 scattered, 15 miles visibility, with winds 300 degrees at 12 knots, with gusts to 20 knots, temperature 34 degrees (F), and dew point 14 degrees (F), 40 minutes after the accident.

Local eyewitnesses to the accident, stated that the sky was clear, and visibility was good, with

wind out of the west.

WRECKAGE AND IMPACT INFORMATION

Witnesses stated that the breakup of the airplane occurred in flight; however, they were not able to estimate the altitude of the airplane at the time of the event. Radar recordings of the accident airplane show the last recorded altitude of 6,500 feet mean sea level. A surveyor who assisted with the wreckage diagram stated that the average elevation at the debris site was 950 feet mean sea level.

According to the surveyor's diagram the debris from the airplane lay on a heading of approximately 080 degrees magnetic. The engine lay at the most westerly point with the remainder of the airplane spreading out east northeasterly in a fan shaped trail to 1.32 statute miles where the furthest part was located.

A summary of the examination of the wreckage follows:

The right and left stabilizers separated from the fuselage. Both the right and left stabilizer rear spars exhibited downward bending at the fractures. The right and left stabilizer leading edge cuffs were intact. Neither of the stabilizers exhibited paint scuff marks and had no chordwise crushing. The right elevator trim tab cables tore through the lower surface of the right stabilizer from the outboard inspection hole inboard to the stabilizer root. The fuselage attachment hardware for the right and left stabilizer spars were intact. The bulkheads in the fuselage did not appear to be cracked and had minor distortion. The sides of the aft fuselage skin, between the bulkheads did not exhibit aft to upper forward, diagonal buckling.

The left ruddervator was separated from the stabilizer and fractured at about mid-span, with the elevator trim tab attached to the inboard half of the ruddervator. The left ruddervator torque fitting was separated from the ruddervator and remained attached to its control rod. The trim tab cables were separated from the left elevator trim tab. The outboard half of the right ruddervator remained attached to the stabilizer and the inboard half was separated from the stabilizer, with the elevator trim tab attached. The right ruddervator torque fitting was separated from the ruddervator and is missing. The balance weights were torn away from both ruddervators and are missing. The ruddervator inboard hinge support was intact and the ruddervator stop bolts exhibited no marks. The elevator trim tab actuator extension was seven-eighths inches, which is consistent with an eight degrees nose down trim tab deflection.

The right wing separated from the fuselage at the wing root junction to the fuselage. The separation occurred just inboard of the front wing attachment fittings and outboard of the rear wing attachment fittings. The leading edge exhibited aft and upwards crushing from wing station 45 and 136. The landing gear, flap, and aileron remained attached to the right wing. The right flap actuator extension was two and one-sixteenth inches, which is consistent with two degree flap extension.

The left wing was separated into three main pieces; the wing leading edge structure from wing station 23.881 to about wing station 66, and from the front spar forward with the majority of the front spar carry-through structure attached; the rear spar from the wing attachment fittings to about wing station 108, with the flap assembly attached; and the remainder of the wing structure, with the aileron attached. The left flap actuator extension was one and three-quarters inches, which is consistent with the fully retracted position.

The upper cap channel on the right side of the front spar carry-through structure exhibited

downward bending and counterclockwise twisting, as viewed from the outboard end. The landing gear actuator was intact and attached to the front spar carry-through structure, and exhibited a fully retracted position.

The fuselage remained intact from the rear spar carry-through structure to the bulkhead at fuselage station 272. The left and right wing attachment fittings were attached to their respective fuselage fittings on the rear spar carry-through structure, with the wing attach bolts and nuts intact. The rudder cables ripped through the center of the fuselage belly skin from the rear spar carry-through structure to fuselage station 207.

The engine, propeller, and firewall, were embedded in the ground about six feet deep and remained attached to the fuselage nose section, nose landing gear, forward cockpit area, and instrument panel. The throttle control, mixture control, and propeller control were in the full forward positions, with their control cables attached to the respective engine components. The control wheel and arm assembly were in the left position.

The propeller assembly was intact with both blades bending aft. There were small gouges on the leading edges of the propeller with a large gouge in one leading edge approximately 12 inches inboard of the tip. The propeller remained attached to the crankshaft propeller flange. The crankcase did not exhibit holes and all of the engine cylinders were attached to the crankcase.

Both of the front seats were found intact. The seat belts were attached to the seat frames and were not latched. No deformation of the seat belts was evident on inspection.

MEDICAL AND PATHOLOGICAL INFORMATION

An Autopsy was performed on the pilot by the Fairview Riverside Medical Center, Minneapolis, Minnesota, on October 4, 1993. The pilot was ejected from the airplane during the accident sequence. An interview with the Deputy Coroner who was present at the post mortem examination revealed that the multiple traumatic injuries sustained by the pilot were as a result of impact with the terrain. Toxicological examination of specimens from the pilot were negative.

TESTS AND RESEARCH

A recorded radar study was conducted by the NTSB's Office of Research and Engineering, and a copy of that report is made an addendum to this report.

The radar track in the report follows the progress of the flight of N4421D for most of the accident flight with the accident airplane cruising at about 7,000 feet mean sea level at about 190 knots ground speed on a ground track of about 140 degrees true. The last recorded altitude was at about 6,500 feet mean sea level with the airplane in a descent.

A Metallurgist's Factual Report was completed by the NTSB's Office of Research and Engineering, and a copy of that report is made an addendum to this report.

The metallurgist's report confirmed damage reported previously in this report.

ADDITIONAL DATA/INFORMATION

Parties to the investigation were the Federal Aviation Administration Flight Standards District Office, Minneapolis, Minnesota; Beech Aircraft, Wichita, Kansas; and Continental Motors, Mobile, Alabama.

The wreckage was released to representatives of the owner on October 4, 1993.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	38, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Unknown
Other Aircraft Rating(s):	None	Restraint Used:	
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 1 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	07/07/1993
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	3900 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BEECH	Registration:	N4421D
Model/Series:	G35 G35	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	D-4574
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	04/20/1993, Annual	Certified Max Gross Wt.:	2775 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	CONTINENTAL
ELT:	Installed	Engine Model/Series:	IO-470-N
Registered Owner:	BEMIDJI AVIATION SERVICES, INC	Rated Power:	260 hp
Operator:	BEMIDJI AVIATION SERVICES, INC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	DLH, 1428 ft msl	Distance from Accident Site:	58 Nautical Miles
Observation Time:	1150 CDT	Direction from Accident Site:	5°
Lowest Cloud Condition:	Scattered / 4500 ft agl	Visibility	15 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	12 knots / 20 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	1°C / -10°C
Precipitation and Obscuration:			
Departure Point:	BIMIDJI, MN (BJI)	Type of Flight Plan Filed:	None
Destination:	RICE LAKE, WI (RIE)	Type of Clearance:	None
Departure Time:	1025 CDT	Type of Airspace:	Class G

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	STEPHEN A WILSON	Report Date:	12/02/1994
Additional Participating Persons:	TED SCHOENFELDER; MINNEAPOLIS, MN DON KNUTSON; WICHITA, KS DALE CARTER; MOBILE, AL		
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.nts.gov/pubdms/ .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).