



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	CHICAGO, IL	<b>Accident Number:</b>	CHI00FA027
<b>Date &amp; Time:</b>	11/11/1999, 2020 CST	<b>Registration:</b>	N869
<b>Aircraft:</b>	Beech 200	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	3 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Business		

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## Analysis

Shortly after being cleared for takeoff on runway 18 (3,899 feet by 150 feet, dry concrete) at Merrill C. Meigs Field, Chicago, Illinois, the airplane impacted into Lake Michigan, approximately 300 feet south of the end of the runway. The tower controller said that at the 3/4 field point, the airplane had not rotated. 'All I can see are lights [from the airplane]. At the point where he would have been at the end of the runway, [I] lost the lights.' A witness on the airport said that when the airplane went by, it 'didn't sound like most King Airliners do at that point.' There was a pulsating sound, but it was not heavy. The witness said that the airplane was 'bouncing up and down on the [gear] struts, and wasn't coming off the ground.' NTSB Materials examination of the pilot's control yoke showed that there were small distortions in the holes of the column and the rod where the control lock would be inserted. A small crack was observed around 1/4 of the control lock rod hole. The control lock was a substitute for the original airplane equipment. The examination of the control lock showed 'several shiny scratches ... parallel to the length of the pin.' A small deformation was observed near the top of the pin part of the control lock. The company flight department's third pilot said that when they flew the airplane, they always placed the control lock in the pilot's side cockpit wall pocket, along with a car key and a remote hanger door opener. The car key and the door opener were found in the wall pocket during the on-scene investigation. The control lock was recovered from the lake, 7 days later.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: On ground collision with the lake for undetermined reasons.

## Findings

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Occurrence #1: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER  
Phase of Operation: TAKEOFF

### Findings

1. (C) REASON FOR OCCURRENCE UNDETERMINED
2. ACFT/EQUIP,INADEQUATE AIRCRAFT COMPONENT - COMPANY/OPERATOR MANAGEMENT

## Factual Information

### HISTORY OF FLIGHT

On November 11, 1999, at 2020 central standard time (cst), a Beechcraft 200, N869, operated by an airline transport pilot, was destroyed when it impacted into the water immediately after takeoff from runway 18 (3,899 feet by 150 feet, dry concrete) at Merrill C. Meigs Field, Chicago, Illinois. Visual meteorological conditions prevailed at the time of the accident. The corporate business flight was being operated under 14 CFR Part 91. No flight plan was on file. The pilot, copilot, and passenger on board, sustained fatal injuries. The cross-country flight to South Bend, Indiana, was originating at the time of the accident.

A line employee for the fixed base operator, who removed the wheel chocks before the airplane taxied, said that neither pilot performed "any kind of walk-around or exterior preflight check of the airplane." He said that they started engines right away. As soon as they had the engines going, they were taxiing. The line employees said that he did not see any flight control surfaces move while the airplane was on the ramp.

The contract air traffic controller on duty at the time of the accident said that N869 called for taxi and told him that they were "VFR to South Bend", [Indiana]. The controller said that at the time he called, the winds were calm, so he gave N869 his choice of runways. The pilots requested runway 18. The controller said that he held N869 momentarily to check on air traffic that was going into Midway Airport. The controller then cleared N869 for takeoff. They acknowledged that they were cleared for takeoff. The controller said that the airplane back-taxed onto the overrun for runway 18. From there, they began their takeoff run. The controller said that at "3/4 field, he had not rotated. Pretty unusual for a King Air. All I can see are lights [from the airplane]. At the point where he would have been at the end of the runway, [I] lost the lights." The controller said that he "can hear the airplane as it goes past the tower. There was no surging or anything that I would know."

A witness on the ramp said that when the airplane went by, it "didn't sound like most King Airs do at that point." The witness described the engine sound as being a "lower pitch sound, not the high pitch sound you normally hear. He (the airplane) sounded just like it does when it lands, just before he goes into "beta". The engine sound was a different sound. There was some pulsating, but it was not heavy." The witness said that the airplane was "bouncing up and down on the [gear] struts, and wasn't coming off the ground. The airplane never changed noises and didn't change attitude."

### PERSONNEL INFORMATION

Both the pilot and copilot were employed as corporate pilots for Jaymar Ruby, Incorporated, Michigan City, Indiana. Both pilots were certified by the company to serve as pilot-in-command in the BE-200 airplane.

The pilot held an airline transport pilot certificate with single and multi-engine land, and single-engine sea, instrument airplane, and glider ratings.

The pilot also held a certified flight instructor-instrument certificate (CFII) with privileges to instruct in single and multi-engine, instrument airplanes. The certificate had been renewed on March 8, 1999.

According to records provided by the Federal Aviation Administration (FAA) Aeromedical

Certification Division, the pilot reported having approximately 18,000 total flight hours, on his FAA Report of Medical Examination, dated June 17, 1999.

According to insurance records provided by the company, the pilot had successfully completed BE-200 refresher training on February 28, 1998. At the time he completed this training, the pilot reported having 4,536 hours in the BE-200.

The pilot held a current second class medical certificate, with limitations, dated June 17, 1999. The certificate indicated the pilot "must wear corrective lenses for near vision." Medical records provided by the FAA Aeromedical Certification Division showed the certificate was special issuance under 14 CFR Part 67, Section 67.19, due to the pilot's previous medical history.

The copilot held a commercial pilot certificate with single and multi-engine land, instrument airplane ratings.

The copilot also held a certified flight instructor-instrument certificate (CFII) with privileges to instruct in single-engine land, instrument airplanes. Federal Aviation Administration airman records showed the certificate was last renewed on April 16, 1992.

According to insurance records provided by the company, and the copilot's logbook, the copilot had 13,526.9 total flight hours, 3,819.1 hours in the BE-200.

According to insurance records provided by the company, the copilot had successfully completed BE-200 refresher training on February 26, 1999.

The copilot held a current second class medical certificate, with limitations, dated October 29, 1998. The certificate indicated the copilot "must wear corrective lenses for near vision."

#### AIRCRAFT INFORMATION

The airplane, serial number BB-176, was manufactured in August 1976. At the time of the accident, the airplane was owned and operated by Jaymar Ruby, Incorporated, Michigan City, Indiana, and was used for corporate business travel.

The airplane had undergone a continuous airworthiness inspection on August 19, 1999. The total airframe time recorded at the inspection was 8,514.0 hours.

The Hobbs meter reading, following recovery of the airplane from the water, indicated 8,635.6 hours.

#### WRECKAGE AND IMPACT INFORMATION

The NTSB on-scene investigation began on November 11, 1999, at 2215 cst.

The airplane was located at the bottom of Lake Michigan, resting in 22 feet of water, approximately 300 feet south and 100 feet east of an extended centerline off runway 18 at Meigs Field.

The airplane main wreckage was recovered from the water on November 12, 1999. The main wreckage consisted of the airplane's fuselage, empennage, right wing, and right engine.

The airplane's nose section, to include the avionics bay and forward landing gear compartment, just forward of the forward pressure bulkhead, was broken laterally at fuselage station 72.380. The nose section was crushed inward and down, and broken open at the avionics bay. The nose gear and nose gear doors were broken out.

The airplane's fuselage, from fuselage station 72.380 aft to station 347.750, was predominately intact. The bottom of the fuselage was torn rearward, beginning at fuselage station 72.380, and running aft to fuselage station 207.125. The cockpit floor, and forward cabin floor were broken downward and aft. The instrument panel was broken forward and down. The center control console, containing the throttles, propeller controls, and power levers, was broken down and left. The pilot seats were bent forward and down. The forward cabin seats were broken out and pushed forward. The galley and three of five cabin partitions were broken out and destroyed.

The airplane's aft fuselage, to include the vertical stabilizer, rudder, and T-tail horizontal stabilizers and elevators was broken downward laterally, just behind the aft pressure bulkhead, at fuselage station 347.750. The fuselage section remained attached to the cabin section by flight control cables and electrical wiring. The aft fuselage section and bottom dorsal fin, beginning at the fracture, and running aft to the tailcone, was crushed upward and right. The vertical stabilizer showed minor skin wrinkles and tears. The rudder showed no damage. Flight control continuity to the rudder was confirmed. The left horizontal stabilizer and showed upward bending and rearward crushing along the leading edge, outboard of left horizontal stabilizer station 58.000. The left elevator showed minor upward bending and skin wrinkles. The right horizontal stabilizer showed minor downward bending, skin wrinkles and small tears in the upper skin, outboard of right horizontal fuselage station 74.000. The right elevator showed no damage. Flight control continuity to the elevators was confirmed.

The airplane's right wing remained attached to the fuselage at the rear spar and skin. The wing section was broken upward and aft, longitudinally, at the wing root. The inboard wing section, between stations 37.000 and 85.000, was broken open rearward, beginning at the leading edge. The inboard bladder fuel tank was broken open. Fuel stains were observed on the upper wing skin. The smell of fuel was prevalent. The right engine cowling was broken open and bent rearward. The right engine was intact. The right propeller was broken off torsionally at the propeller shaft, just forward of the propeller governor. The right main landing gear was broken out at the upper landing gear cylinder. The main landing gear doors were broken out. The right wing, outboard of the engine nacelle, was intact, but showed rearward crushing in the skin and de-icing boot, at several places along the leading edge. The right flap sections were up and showed no damage. The right aileron showed minor skin wrinkles and upward bends. Flight control continuity to the right aileron was confirmed.

The airplane's left wing and left engine were located in 22 feet of water, approximately 270 feet south, and 90 feet east of an extended centerline off runway 18. The left wing and engine were recovered on November 13, 1999.

The airplane's left wing was broken aft at the wing root. The inboard wing section, between stations 37.000 and 85.000, was broken open rearward, and fragmented. The inboard bladder fuel tank was broken open. Fuel stains were observed on the upper wing skin. The smell of fuel was prevalent. The left engine cowling was broken off exposing the left engine. The left engine was intact. The engine mounts were twisted and broken counter-clockwise. The left propeller was broken off torsionally at the propeller shaft, just forward of the propeller governor. The left main landing gear was broken out at the upper landing gear cylinder. The main landing gear doors were broken out. The left wing, outboard of the engine nacelle, was intact, but showed rearward crushing in the skin and de-icing boot, at several places along the leading edge. The wing also showed bends and wrinkles in the upper skin. The inboard left

flap was broken out and fragmented. The outboard left flap section was up and showed upward bending and skin wrinkles. The left aileron was attached at the inboard hinge. The outboard hinge was broken rearward. The aileron was bent upward 40 degrees at wing station 276.016 and bent downward 50 degrees at wing station 223.235. Flight control continuity to the right aileron was confirmed.

The airplane's left propeller was located at the bottom of Lake Michigan, resting in 22 feet of water, approximately 300 feet south and 100 feet east of an extended centerline off runway 18 at Meigs Field. It was recovered on November 18, 1999. All three propeller blades showed torsional bending, and scratches running chordwise and laterally across the blades' front surfaces. All three blades also showed nicks along the leading edge toward the blade tips.

The airplane's right propeller was located at the bottom of Lake Michigan, resting in 22 feet of water, approximately 300 feet south and on the extended centerline of runway 18 at Meigs Field. It was recovered on November 24, 1999. All three propeller blades showed torsional bending, and scratches running chordwise and laterally across the blades' front surfaces. All three blades also showed nicks along the leading edge toward the blade tips.

The two engines, two propellers, parts from the pilot's control yoke, the column control lock pin, and two warning light panels and two caution-warning switches from the airplane's instrument panel were retained for further examination.

#### MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies on the pilot and copilot were conducted by the Cook County, Illinois, Medical Examiner, at Chicago, Illinois, on November 13, 1999.

A review of pilot's records provided by the FAA Aeromedical Certification Division, indicated the pilot was diagnosed on January 14, 1990, as having "myocardial infarction." The pilot underwent an "emergency percutaneous transluminal coronary angioplasty" for "99% stenosis of the left anterior descending coronary artery", on January 16, 1990. The pilot was denied a medical certificate until October 21, 1992, when a special issuance restricted (12 month) third class medical certificate was approved. A special issuance restricted (6 month) second class medical certificate was authorized on August 14, 1995. An Authorization for Special Issuance of Medical Certificate (Authorization) letter, dated November 15, 1999, extended the authorization of pilot's June 17, 1999, second class medical certificate, to June 30, 2000. The NTSB Medical Officer's Factual Report is attached as an addendum to this report.

FAA toxicology testing of specimens from the pilot were negative for all tests conducted.

FAA toxicology testing of specimens from the copilot were negative for all tests conducted.

#### TESTS AND RESEARCH

The parts from the pilot's control yoke, the column control lock pin, and two warning light panels and two caution-warning switches from the airplane's instrument panel, were examined at the National Transportation Safety Board Materials Laboratory, Washington, DC, on January 13, 2000.

The examination of the pilot's control yoke showed that when the rod and column pieces were reassembled, "the holes for the control lock in the inner and outer columns did not line up with the components in their as-received condition. The distance between the holes in the column and the hole in the rod was approximately 2.56 inches."

An examination of the control rod hole showed at one end, "the diameter in the plane perpendicular to the length of the rod was 0.324 inch and parallel to the length of the rod 0.312 inch. On the other side of the rod, these measurements were 0.313 inch and 0.325 inch respectively." A small crack was seen between "the connection of the tubular insert and the rod. The crack was around almost a quarter of the insert."

Examination of the control lock showed that it "had no severe damage and was not bent." An inspection of the pin of the control lock revealed "several shiny scratches. Some of the scratches were circular around the pin, others were spiral. Many scratches were parallel to the length of the pin." The inspection also revealed a small deformation "seen at approximately 0.875 inch from the top of the pin."

Examination of light bulbs from the two warning light panels and two caution-warning switches showed no evidence of stretching in the filaments. The Materials Laboratory Factual Report is attached as an addendum to this report.

The propellers were examined at Hartzell Propeller, Incorporated, Piqua, Ohio, on February 3, 2000. The examination revealed no discrepancies that could have precluded normal operations with either propeller. Blade angle findings ranged at points from -2 degrees to 75 degrees, placing the blade angles in the normal operating range.

The engines were examined at Pratt and Whitney, Canada, Longueuil, Quebec, Canada, May 3 and 4, 2000.

The examination of the left engine (PT6A-41, serial number 80378) revealed circumferential scoring to the first and third stage compressor shrouds. Two of the first stage compressor disc blades leading edge outer spans were deformed forward and away from the direction of rotation. First stage blade tips displayed light circumferential rubbing. The centrifugal impeller showed circumferential rubbing. The centrifugal impeller shroud showed circumferential scoring due to axial contact with the impeller. The compressor turbine vane ring inner drum downstream side showed circumferential rubbing from the 4 o'clock to 12 o'clock positions, and light circumferential scoring around the remainder of the circumference. The compressor turbine shroud showed heavy circumferential rubbing from the 4 o'clock to 12 o'clock positions, and light circumferential scoring around the remainder of the circumference. The compressor turbine blade tips showed light rubbing. The first and second stage power turbine shrouds showed heavy circumferential scoring. The first and second stage power turbine disc blade tip knife edges showed circumferential rubbing.

The examination of the right engine (PT6A-41, serial number 80377) revealed circumferential scoring to the first stage compressor shroud. One of the first stage compressor disc blades leading edge outer spans was deformed forward and away from the direction of rotation. First stage blade tips displayed light circumferential rubbing. The centrifugal impeller showed circumferential rubbing. The centrifugal impeller shroud showed circumferential scoring due to axial contact with the impeller. The compressor turbine shroud showed heavy circumferential rubbing from approximately the 3 o'clock to 5 o'clock positions, and light circumferential scoring around the remainder of the circumference. The compressor turbine blade tips showed circumferential rubbing. The first and second stage power turbine shrouds showed heavy circumferential scoring. The first and second stage power turbine disc blade tip knife edges showed circumferential rubbing.

No discrepancies which could have precluded normal engine operation prior to the airplane's

impact with the water were revealed.

A third pilot, employed by Jaymar Ruby, Incorporated, said that he saw both pilots in the afternoon of the day before the accident flight, at Jaymar Ruby's flight department, in Michigan City, Indiana. He said that they discussed the coming trip schedule. The pilot was also the company's Chief Pilot. The third pilot said that the pilot looked good. There was nothing distinctive or unusual about him. They talked about the trip to Meigs, scheduled for the following day. The original plan was for the pilot to fly by himself, from Michigan City to South Bend, Indiana, to pick up the passenger. The copilot said that he had nothing going on that day, and offered to go along on the flight.

The third pilot said that when they flew the airplane, they always placed the airplane's control lock in the pilot's side cockpit wall pocket, along with a key for a car which the flight department kept at South Bend, Indiana, and a remote door opener to the airplane's hanger at Michigan City. During the on-scene investigation, the car key and the remote door opener were found in the pilot's side cockpit wall pocket. The control lock was recovered from Lake Michigan with the airplane's left propeller on November 18, 1999.

The control lock used on N869 was a substitute for the original equipment. It consisted of a 3-inch long, 1/4-inch diameter steel pin, with a 3-inch long, 1-inch wide piece of red-painted, angled steel, attached at the top of the pin with a nut. The pin inserts through the aligned holes in the pilot's control yoke.

The original airplane control lock system consists of three components, a control lock pin, a "U"-shaped clamp which fits around the engine control levers, and an "L"-shaped pin which inserts into the floor of the airplane, aft of the rudder pedals, and through the rudder bellcrank, preventing rudder movement. All three components are tied together by chains.

#### ADDITIONAL INFORMATION.

Parties to the investigation were the Federal Aviation Administration Flight Standards District Office, West Chicago, Illinois, Raytheon Aircraft Company, Wichita, Kansas, Pratt and Whitney, Montreal, Quebec Province, Canada, and Hartzell Propeller, Incorporated, Piqua, Ohio.

The wreckage was released and returned to Aviation Accident and Investigation Management, Burr Ridge, Illinois.

## Pilot Information

<b>Certificate:</b>	Airline Transport; Flight Instructor; Commercial	<b>Age:</b>	71, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land; Single-engine Sea	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Glider	<b>Restraint Used:</b>	Seatbelt
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 2 Valid Medical--w/ waivers/lim.	<b>Last Medical Exam:</b>	06/17/1999
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	18000 hours (Total, all aircraft), 4536 hours (Total, this make and model), 2 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	Beech	<b>Registration:</b>	N869
<b>Model/Series:</b>	200 200	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	BB-174
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	11
<b>Date/Type of Last Inspection:</b>	08/19/1999, Continuous Airworthiness	<b>Certified Max Gross Wt.:</b>	12500 lbs
<b>Time Since Last Inspection:</b>	122 Hours	<b>Engines:</b>	2 Turbo Prop
<b>Airframe Total Time:</b>	8636 Hours	<b>Engine Manufacturer:</b>	P&W
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	PT6A-41
<b>Registered Owner:</b>	JAYMAR RUBY, INCORPORATED	<b>Rated Power:</b>	850 hp
<b>Operator:</b>	JAYMAR RUBY, INCORPORATED	<b>Air Carrier Operating Certificate:</b>	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night/Bright
Observation Facility, Elevation:	CGX, 593 ft msl	Observation Time:	2045 CST
Distance from Accident Site:	1 Nautical Miles	Direction from Accident Site:	360°
Lowest Cloud Condition:	Unknown / 0 ft agl	Temperature/Dew Point:	8° C / 5° C
Lowest Ceiling:	Overcast / 1500 ft agl	Visibility	10 Miles
Wind Speed/Gusts, Direction:		Visibility (RVR):	0 ft
Altimeter Setting:	30 inches Hg	Visibility (RVV):	0 Miles
Precipitation and Obscuration:			
Departure Point:	(CGX)	Type of Flight Plan Filed:	None
Destination:	SOUTH BEND, IN (SBN)	Type of Clearance:	None
Departure Time:	2020 CST	Type of Airspace:	Class B

## Airport Information

Airport:	MERRILL C. MEIGS FIELD (CGX)	Runway Surface Type:	Asphalt
Airport Elevation:	593 ft	Runway Surface Condition:	Dry
Runway Used:	18	IFR Approach:	None
Runway Length/Width:	3899 ft / 150 ft	VFR Approach/Landing:	None

## Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Fatal	Latitude, Longitude:	

## Administrative Information

Investigator In Charge (IIC):	DAVID C BOWLING	Adopted Date:	05/08/2001
Additional Participating Persons:	CURT C LINDAUER; WEST CHICAGO, IL EDDIE E WEBBER; WICHITA, KS THOMAS A BERTHE; LONGUEUIL, THOMAS MCCREARY; PIQUA, OH		
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 <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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.