



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Middlesboro, Kentucky	<b>Accident Number:</b>	NYC03FA148
<b>Date &amp; Time:</b>	July 5, 2003, 11:15 Local	<b>Registration:</b>	N205
<b>Aircraft:</b>	Beech F-35	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

About 8 miles south of the destination airport, the pilot advised the air traffic controller that he had the airport in sight. The air traffic controller terminated the flight following and instructed the pilot to contact the airport UNICOM for advisories. No further radio transmissions were received from the airplane. Review of radar data revealed a target, transmitting a 1200 beacon code, southwest of the airport. The target was traveling northeast, level at 5,500 feet. The target remained in level flight, until it began a descent about 8 miles south of the airport. The target continued the descent and made a right turn about 2 miles east of the airport. About 3 miles northeast of the airport, the target was at an altitude of 4,400 feet, heading east. There were no further radar returns received from the target. Data extracted from a hand-held global positioning system (GPS) found in the wreckage, revealed that about 2 miles east of the airport, the airplane began a right hand turn, at 142 knots. During the turn, the airspeed increased an average of 8.6 knots over a 25 second period, to where the last GPS data point was recorded, about 3 miles northeast of the airport, as a heading of 163 degrees magnetic, and airspeed of 211 knots. The airplane experienced an in-flight breakup along a ridgeline within the Cumberland Gap National Historical Park. The weather recorded at the destination airport, about 6 minute after the accident included, wind from 160 degrees at 4 knots, visibility unrestricted at 10 miles, scattered clouds at 2,700 feet, temperature 83 degrees F, dew point temperature 71 degrees F, altimeter 30.12 Hg. Geostationary Operations Environmental Satellite number 12 (GOES-12) data was obtained from the National Transportation Safety Board's Man-computer Interactive Data Access System (McIDAS) workstation. Examination of the data revealed an area of low clouds in the immediate vicinity of the accident site, with the tops being approximately 4,500 of feet. According to the airplane's Pilot Operating Handbook, the Never Exceed Speed was published as 173 KIAS.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper decision to descend into clouds, and his exceeding the maximum speed and design stress limits of the airplane, which resulted in an in-flight breakup and subsequent collision with terrain.

### Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER

Phase of Operation: DESCENT

Findings

1. (F) WEATHER CONDITION - CLOUDS
2. (C) VFR FLIGHT INTO IMC - INITIATED - PILOT IN COMMAND

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Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: DESCENT

Findings

3. (C) AIRSPEED(VNE) - EXCEEDED - PILOT IN COMMAND
4. (C) DESIGN STRESS LIMITS OF AIRCRAFT - EXCEEDED - PILOT IN COMMAND

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Occurrence #3: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: DESCENT - UNCONTROLLED

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Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

5. TERRAIN CONDITION - RISING

## Factual Information

### HISTORY OF FLIGHT

On July 5, 2003, about 1115 eastern daylight time, a Beech F35, N205, was destroyed during an in-flight break-up and subsequent collision with terrain near Middlesboro, Kentucky. The certificated commercial pilot and passenger were fatally injured. Visual meteorological conditions prevailed, and no flight plan had been filed for the personal flight that departed the McGhee Tyson Airport (TYS), Knoxville, Tennessee, destined for the Middlesboro-Bell County Airport (1A6), Middlesboro, Kentucky. The flight was conducted under 14 CFR Part 91.

According to a Federal Aviation Administration (FAA) inspector, the airplane departed TYS about 1045, and proceeded north at an altitude of 5,500 feet msl. During the flight, the pilot requested, and received, flight-following from air traffic control. When the airplane was about 8 miles south of Middlesboro, the pilot advised the air traffic controller that he had the airport in sight. The air traffic controller terminated the flight following and instructed the pilot to contact the airport UNICOM for advisories. No further radio transmissions were received from the airplane.

Radar data obtained from the FAA revealed a target, transmitting a 1200 beacon code, southwest of 1A6. The target was traveling northeast, level at 5,500 feet. The target remained in level flight, until it began a decent at 1112:52, about 8 miles south of 1A6. At 1113:32, the target continued the descent and made a right turn about 2 miles east of 1A6. At 1113:52, the target was about 3 miles northeast of 1A6, at an altitude of 4,400 feet, heading east. There were no further radar returns received from the target.

Park rangers located the accident site about 1400 on July 6, 2003, approximately 3 miles east of 1A6, within the Cumberland Gap National Historical Park.

The accident occurred during the hours of daylight, at 36 degrees, 37.22 minutes north longitude, 083 degrees, 40.27 minutes west latitude.

### PERSONNEL INFORMATION

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

The pilot had accumulated about 1,974 hours of flight experience, which included about 600 in make and model.

### AIRCRAFT INFORMATION

The airplane was produced on May 22, 1955, and had accumulated a total time of approximately 4,914 hours.

Review of maintenance records revealed the airplanes most recent annual inspection was performed on December 20, 2002.

The engine had been removed, subsequently overhauled, and reinstalled on the airframe on May 13, 2003. According to an owner of the airplane, the engine had accumulated about 12 hours of operation since overhaul. The owner also stated that he had flown the airplane 9 of the 12 hours, and reported no abnormalities with the engine's operation.

Review of the recorded tachometer times during prior annual inspections revealed the airplane had been operated for about 40 hours during the year prior to the annual inspection.

#### METEOROLOGICAL INFORMATION

Middlesboro-Bell County Airport was located approximately 2 miles west of the accident site at an elevation of 1,212 feet. The airport was equipped with an Automated Weather Observation System (AWOS-3). The observations made surrounding the time of the accident are as follows:

At 1101, the AWOS-3 recorded, wind from 160 degrees at 4 knots, visibility unrestricted at 10 miles, skies clear below 12,000 feet, temperature 82 degrees F, dew point temperature 70 degrees F, altimeter 30.12 Hg.

At 1121, the AWOS-3 recorded, wind from 160 degrees at 4 knots, visibility unrestricted at 10 miles, scattered clouds at 2,700 feet, temperature 83 degrees F, dew point temperature 71 degrees F, altimeter 30.12 Hg.

At 1141, the AWOS-3 recorded, wind from 170 degrees at 6 knots, visibility unrestricted at 10 miles, scattered clouds at 2,700, ceiling broken at 3,700 feet, temperature 28 degrees Celsius (83 degrees F), dew point temperature 21 degrees C (71 degrees F), altimeter 30.13 inches of Hg.

At 1201, the AWOS-3 recorded, wind from 160 degrees at 4 knots, visibility unrestricted at 10 miles, ceiling broken at 2,700 feet, temperature 28 degrees Celsius (83 degrees F), dew point temperature 21 degrees C (70 degrees F), altimeter 30.12 inches of Hg.

Geostationary Operations Environmental Satellite number 12 (GOES-12) data was obtained from the National Transportation Safety Board's Man-computer Interactive Data Access System (McIDAS) workstation. Both infrared and visible imagery from 1045 through 1145 at approximately 15-minute intervals was obtained surrounding the time of the accident. Examination of the imagery revealed an area of low clouds in the immediate vicinity of the

accident site. No cumulonimbus clouds were identified in the vicinity of the accident site surrounding the time of the accident and no orographic clouds associated with mountain wave activity were clearly identified. The radiative cloud top temperature was recorded as 291.0 degrees Kelvin or 17.84 degrees C, which corresponded to cloud tops in the range 4,500 of feet. The cloud tops were at the approximate level of the last reported altitude of the accident airplane at 4,400 feet msl.

Examination of the visible image revealed an area of scattered to broken layer of stratocumulus clouds extending over the Middlesboro area and to the west of the accident site. The clouds were oriented in northeast to southwest bands or cloud streets, oriented parallel to the low level wind flow and terrain. One of the bands of clouds was located immediately to the west of the accident site.

## WRECKAGE AND IMPACT INFORMATION

The wreckage path was oriented about a 180-degree magnetic heading, and measured approximately one-half mile in length. The elevation of the wreckage path varied between 1,600 feet and 1,700 feet.

The left and right horizontal stabilizers were located near the beginning of the wreckage path. Their failure areas were consistent with a separation in a downward direction. The left and right wing sections, which were located about the mid-point of the wreckage path, revealed buckling on the top surfaces. Both main wing spars remained attached to the front carry through structure. The front carry through structure separated 8-inches from the right wing front spar attach fitting. Both rear spars separated on the wing side of their attach fittings. The front carry through separation and the rear spar separations were in a downward direction. All of the fracture areas examined on the stabilizers and wings were consistent with overstress.

The left and right flaps and landing gear assemblies were observed in the retracted position. Approximately 10 gallons of fuel remained in the right wing auxiliary tank. The remaining fuel tanks were breached and did not contain fuel.

The rear fuselage along with the separated lower cabin structure and rear carry through structure were located about 150 feet before the end of the wreckage path.

The engine, firewall, and instrument panel portion of the wreckage were located at the furthest point south on the wreckage path, and contained evidence of a small post-impact fire. No evidence of fire was observed on any of the separated sections of the wings, main fuselage or empennage.

The throttle, mixture and propeller controls were observed in the full forward position at the instrument panel. The throttle and mixture control cables were separated from their respective control arms on the carburetor.

The engine came to rest in a near vertical position, with the propeller imbedded in the ground, and the front cylinders in contact with the ground. Impact forces separated the propeller governor, governor drive, engine driven fuel pump, oil scavenge pump, carburetor, and oil sump. The remaining engine accessories were found attached to the engine. The aft engine accessory area was exposed to a post-impact fire. Numerous pieces of diagonal cut wood were found next to the engine and propeller. One propeller blade remained in contact with the base of a small tree, which exhibited a diagonal cut at the point of contact. The number 1 and number 3 cylinder top spark plugs were removed for examination. Their electrodes were gray in color and remained intact.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Commonwealth of Kentucky, Justice Cabinet, Medical Examiner's Office, Frankfort, Kentucky, performed an autopsy on the pilot, on July 8, 2003.

The FAA Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma conducted toxicological testing on the pilot.

## ADDITIONAL INFORMATION

### Global Positioning System (GPS)

A hand-held global positioning system (GPS) was found in the wreckage, and was forwarded to the manufacturer for data extraction under FAA supervision. The data revealed that the airplane departed from TYS, and proceeded in a northerly direction at an average airspeed of 145 knots. About 2 miles east of 1A6, the airplane began a right hand turn, at 142 knots. During the turn, the airspeed increased an average of 8.6 knots over a 25 second period, to where the last GPS data point, about 3 miles northeast of the airport, was recorded as a heading of 163 degrees magnetic, and airspeed of 211 knots. The last data point was located about 3 miles northeast of 1A6, along the 1,640 foot level of the Cumberland Gap National Historical Park ridgeline. The data recorded by the GPS unit did not include altitude information. Three additional data points were recorded by the GPS; however, the data was inaccurate.

According to the airplane's Pilot Operating Handbook, the Never Exceed Speed was published as 173 KIAS. A remark regarding the Never Exceed Speed stated, "Do not exceed this speed in any operation." The Maximum Structural Cruising Speed was 150 KIAS. A remark regarding the Maximum Structural Cruising Speed stated, "Do not exceed this speed except in smooth air and then only with caution." The Maneuvering Speed was 129 KIAS. A remark regarding the Maneuvering Speed stated, "Do not make full abrupt control movements above this speed."

The Cumberland Gap National Historical Park ridgeline was a line of rising terrain that began about 3 miles east of 1A6. The elevation at the base of the ridge was about 1,250 feet, and

rose to a peak elevation of 2,480 feet, 1.5 miles from the base. The peak was located about 1 mile southeast of the accident site.

The airplane wreckage was released on July 7, 2003, to a representative of the owners insurance company.

### Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	65, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 Valid Medical-w/ waivers/lim	<b>Last FAA Medical Exam:</b>	May 9, 2003
<b>Occupational Pilot:</b>	UNK	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	1974 hours (Total, all aircraft), 600 hours (Total, this make and model)		

### Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Beech	<b>Registration:</b>	N205
<b>Model/Series:</b>	F-35	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	D4183
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	December 20, 2002 Annual	<b>Certified Max Gross Wt.:</b>	2750 lbs
<b>Time Since Last Inspection:</b>	12 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	4886 Hrs at time of accident	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	Installed, activated, aided in locating accident	<b>Engine Model/Series:</b>	E-225-8
<b>Registered Owner:</b>	BBF&K LLC.	<b>Rated Power:</b>	225 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	1A6,1212 ft msl	<b>Distance from Accident Site:</b>	3 Nautical Miles
<b>Observation Time:</b>	11:21 Local	<b>Direction from Accident Site:</b>	90°
<b>Lowest Cloud Condition:</b>	Scattered / 2700 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	4 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	160°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.12 inches Hg	<b>Temperature/Dew Point:</b>	83°C / 71°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Knoxville, TN (TYS )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Middlesboro, KY (1A6 )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	10:37 Local	<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	Middlesboro Airport 1A6	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	1212 ft msl	<b>Runway Surface Condition:</b>	Unknown
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Unknown

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	36.625831,-83.679443



## Administrative Information

<b>Investigator In Charge (IIC):</b>	Demko, Stephen
<b>Additional Participating Persons:</b>	John Cox; FAA; Louisville, KY Paul Yoos; Raytheon Aircraft; Wichita, KS Al Butler; Teledyne Continental Motors; Mobile, AL
<b>Original Publish Date:</b>	December 28, 2004
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB traveled to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=57384">https://data.nts.gov/Docket?ProjectID=57384</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).