



Landing Aircraft Collides During Rollout with Aircraft Taking Off on Intersecting Runway

All the occupants of the Beechcraft 1900C and the Beechcraft King Air A90 died from the inhalation of smoke, soot or other products of combustion in the postaccident fire that consumed both aircraft.

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FSF Editorial Staff

The Beechcraft 1900C was making a straight-in approach at dusk (about 10 minutes after sunset) and in visual meteorological conditions (VMC) to Runway 13 at Quincy (Illinois, U.S.) Municipal Airport, an uncontrolled airport. A Beechcraft King Air A90 was in takeoff position on Runway 04, which intersected Runway 13. Waiting in the runup area, second in line for takeoff behind the twin-turboprop King Air, was a single-engine Piper Cherokee (PA-28).

Several seconds before the Beech 1900C touched down on Runway 13, the King Air began its takeoff run on Runway 04. Despite evasive action by the pilots of both aircraft, the two aircraft collided on the ground at the intersection of the two runways.

There were 10 passengers and a flight crew of two in the Beech 1900C and two persons — a pilot and passenger-pilot — in the King Air. All were killed in the Nov. 19, 1996, accident.

The Beech 1900C was operated by Great Lakes Aviation Inc., doing business as United Express. The aircraft was on a scheduled passenger flight under U.S. Federal Aviation Regulations (FARs) Part 135. The King Air was operating under Part 91. Both aircraft were destroyed by the impact and postaccident fire. The Beech 1900C was valued at US\$3 million; the estimated value of the King Air was \$225,000.

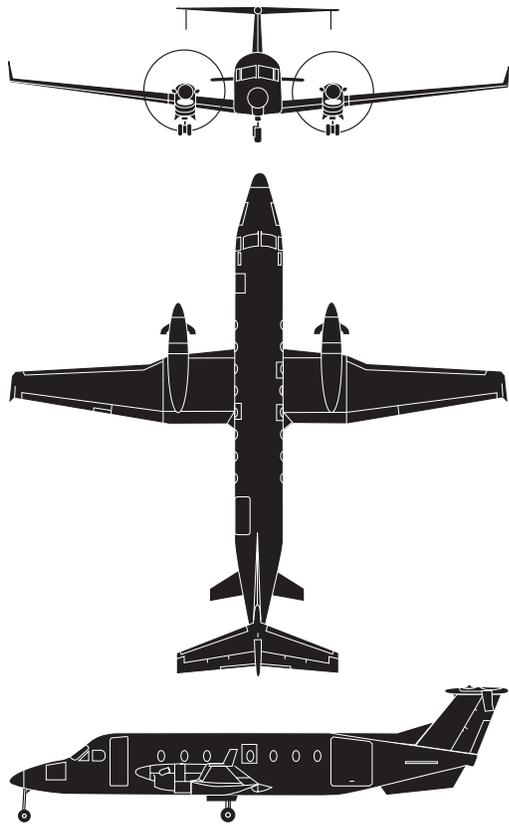


The official accident report of the U.S. National Transportation Safety Board (NTSB) said, "The [NTSB] determines that the probable cause of this accident was the failure of the pilots in the King Air ... to effectively monitor the common traffic advisory frequency [CTAF] or to properly scan for traffic, resulting in their commencing a takeoff roll when the Beech 1900C (United Express Flight 5925) was landing on an intersecting runway.

"Contributing to the cause of the accident was the Cherokee pilot's interrupted radio transmission, which led to the Beech 1900C pilots' misunderstanding of the transmission as an indication from the King Air that it would not take off until after [the Beech 1900C] had cleared the runway.

"Contributing to the severity of the accident and the loss of life were the lack of adequate aircraft rescue and fire-fighting services, and the failure of the air-stair door on the Beech 1900C to open."

United Express Flight 5925 originated at Quincy Municipal Airport, where the flight crew checked in at 0415 (all times are Central Standard Time) for a one-day, eight-leg trip. An aircraft mechanical problem developed at the end of the fifth leg, and the flight crew ferried the aircraft to Chicago (Illinois,



Beechcraft 1900C Regional Transport

This twin-turboprop commuter airliner was certificated by the U.S. Federal Aviation Administration (FAA) in November 1983. It is available in two versions: the 1900C airliner, which has a cargo door; and the 1900 Exec-Liner, which is the corporate version.

The Beech 1900C is powered two Pratt & Whitney Canada PT6A-65B turboprop engines. The Hartzell four-bladed propellers are constant-speed, fully feathering and reversible in pitch. The tricycle landing gear is hydraulically retractable; the main landing gear has multiple-disc hydraulic brakes. Avionics include Honeywell electronic flight instrumentation system and weather radar.

When operating as a commercial commuter aircraft, the 1900C accommodates a flight crew of two and 19 passengers.

The Beech 1900C carries (2,027 kilograms) 4,469 pounds of fuel. It has a service ceiling of (7,625 meters) 25,000 feet and a range of (2,906 kilometers) 1,806 miles with 10 passengers and an allowance for visual flight rules (VFR) fuel reserves. It cruises at speeds from (470 kilometers) 292 miles per hour to (494 kilometers) 307 miles per hour, depending on aircraft load.

The Beech 1900C's approach speed at maximum landing weight is (209 kilometers per hour) 113 knots, and the aircraft stalls at (192 kilometers per hour) 104 knots when clean and at its maximum takeoff weight of (7,530 kilograms) 16,600 pounds.

Source: *Jane's All the World's Aircraft*

U.S.) O'Hare International Airport, where it was exchanged for the accident aircraft.

The flight crew then embarked to complete the remaining legs to Burlington, Illinois, U.S., and Quincy. They landed at Burlington at 1625, and departed Burlington at 1637 for Quincy. The flight arrived at Quincy about two hours and 45 minutes behind schedule.

The report said, "According to the cockpit voice recorder (CVR), at 1652:07 a female voice identified as the captain of Flight 5925 stated on the Quincy CTAF that the airplane was about [48 kilometers] 30 miles north of the airport and that they would be landing on Runway 13; she also asked that 'any traffic in the area please advise.' ... No replies were received to this request.

"CTAF is a radio frequency designated for use by pilots operating near uncontrolled airports. Pilots use this frequency to broadcast their positions or intended flight activities or ground operations. [Airline] company personnel who listened to the CVR recording reported that all of the communications were being made by the captain. Company practice is for the pilot not flying (PNF) to handle radio communications."

The female passenger-pilot of the King Air announced that the King Air was taxiing out for takeoff on Runway 04 at Quincy; this was followed by the pilot of the Cherokee announcing that he was "back-taxiing" to Runway 04 at Quincy.

The report said, "At 1655:48, the captain of Flight 5925 commented to the first officer, 'They're both using [runway] four. You're planning on one three still, right?'"

"The first officer replied, 'Yeah, unless it doesn't look good then we'll just do a downwind for four but ... right now plan one three.'

"At 1656:56, the captain of Flight 5925 announced over the CTAF, 'Quincy area traffic, Lakes Air two fifty one [Flight 5925] is a Beech airliner currently [16 kilometers] ten miles to the north of the field. We'll be inbound to enter on a left base for runway one three at Quincy any other traffic please advise.' There was no response."

Two minutes later, the passenger-pilot of the King Air announced that they were holding short of the runway, but would be taking the runway for departure.

The report said, "The captain ... commented 'she's takin' runway four now?'"

"The first officer replied, 'Yeah.'"

"According to the Cherokee pilot, the King Air pulled up far enough on Runway 04 to allow the Cherokee access to Runway 36, and when the King Air went into [takeoff] position on

Runway 04, he taxied the Cherokee into a runup area short of the runway.

“At 1659:29, the captain of Flight 5925 announced, ‘Quincy area traffic, Lakes Air two fifty one is a Beech airliner currently ... just about to turn, about a [10-kilometer] six-mile final for runway ... one three, more like a [eight-kilometer] five-mile final for runway one three at Quincy.’”

“At 1700:16, the captain of Flight 5925 reported that the airplane was ‘on short final for Runway one three’ and asked ‘the aircraft gonna hold in position on Runway four or you guys gonna take off?’”

The King Air passenger-pilot did not respond, but the pilot of the Cherokee did, stating, “Seven six four Juliet ... holding ... for departure on Runway four,” the report said. “The CVR then recorded an interruption in the transmission by a mechanical ‘two hundred’ alert announcement from the ground-proximity warning system (GPWS) in the Beech 1900C. The CVR then recorded the last part of the transmission from the Cherokee as ‘* on the uh, King Air.’”

Later interviews were conducted with the Cherokee pilot, the passenger in the Cherokee and another pilot who was driving his automobile to the airport and saw the approach and landing of the Beech 1900C. According to the two pilots, the Beech 1900C had its landing lights on and made a normal landing on Runway 13.

A time and distance study conducted by the NTSB indicated that the King Air began its takeoff roll about 13 seconds before the Beech 1900C touched down. The occupants of the Cherokee said that the King Air had been in position on Runway 04 for about one minute before beginning its takeoff roll. The Cherokee pilot also said that he did not hear a takeoff announcement from the King Air on the CTAF; no takeoff announcement from the King Air was recorded on the Beech 1900C CVR.

The report said, “At 1701, during Flight 5925’s landing rollout, the airplane collided with the King Air at the intersection of Runways 13 and 04 [Figure 1].”

The first people to reach the accident scene were a pilot employed by the airport’s fixed-base operator (FBO) and two Beech 1900C-qualified United Express pilots. The right side of the Beech 1900C and the King Air were engulfed in fire. The FBO pilot and one of the United Express pilots approached the airplanes.

“The United Express pilot said that he opened the left aft cargo door on the Beech 1900C and black smoke poured out,” said the report. “The FBO pilot said that he could not see the interior of the cabin through the passenger windows because the cabin appeared to be filled with dark smoke. They ran to the forward left side of the Beech 1900C fuselage where the FBO pilot said he saw the captain’s head and arm protruding from her window on the left. She asked them to ‘get the door open.’”

The FBO pilot found the air-stair door handle in the 6 o’clock position, which is the unlocked position. He saw no instructions for opening the door, so he tried to open door by rotating the door handle counterclockwise.

The United Express pilot then intervened, because he believed that the FBO pilot did not know how to operate the door. The United Express pilot properly depressed a button above the handle while rotating the handle (clockwise) from the 3 o’clock position downward toward the unlocked (6 o’clock) position. The handle turned to the unlocked position, but the United Express pilot was unable to open the door.

The report said, “The following instructions for operating the air-stair door were printed on a small placard, with black letters [0.51 centimeter] 0.2 inch high on a white background, that was located aft and slightly lower than the door handle on the exterior of the airplane: ‘PUSH BUTTON AND TURN HANDLE TO OPEN.’”

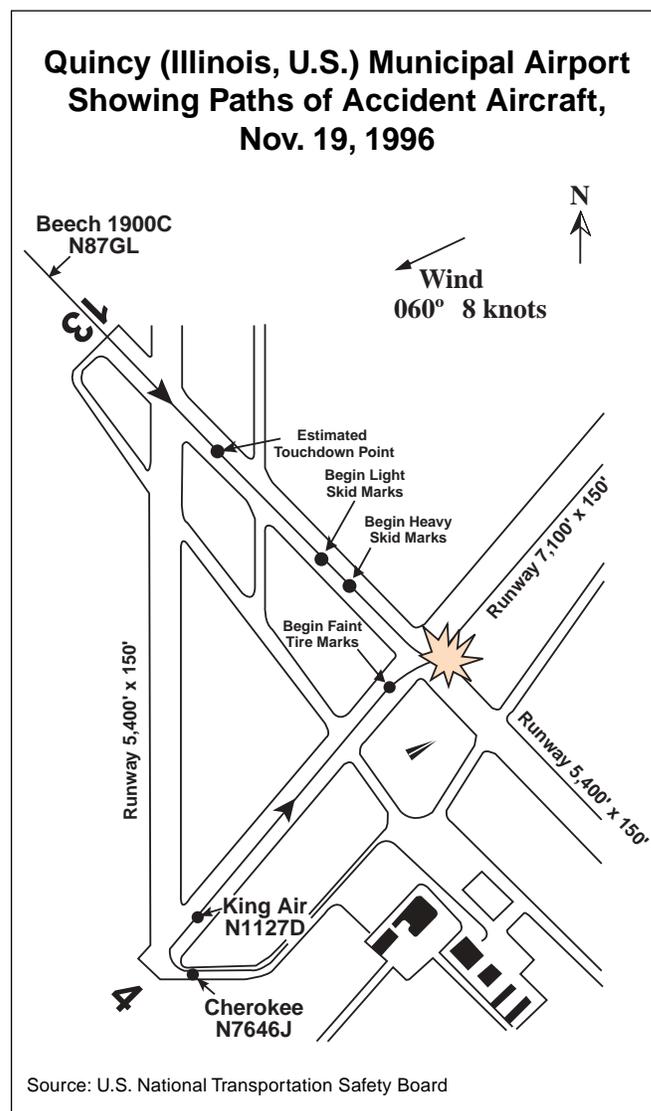


Figure 1

Cockpit Voice Recorder Transcript, United Express Flight 5925, Nov. 19, 1996

This transcript begins at 1652:07, nine minutes before the accident, with the first of the air traffic advisory radio transmissions made by Flight 5925 on the Quincy Municipal Airport common traffic advisory frequency.

Time	Source	Content
1652:07	RDO-1	*** two fifty one is a Beech airliner, just about thirty miles to the north of the field will be inbound for landing runway one three at Quincy. any traffic in the area please advise.
1652:19	HOT-2	[sound of deep breath] OK, cruise if you want.
1652:26	HOT-1	all right ... power is set.
1652:30	HOT-1	engine instruments are checked ... fuel quantity is checked and the auto-feather is going to stay on for the * duration.
1653:45	RDO-?	[sound similar to someone keying microphone seven times]
1654:11	CAM	[sound similar to altitude alert signal]
1654:46	CTR2	Lakes Air two fifty one descend and maintain three thousand, that's pilot discretion.
1654:50	RDO-1	Lakes Air two fifty one, pilots discretion down to three thousand.
1654:54	CTR2	*
1654:56	HOT-1	look at that sunset man, that's gorgeous.
1655:19	1127D4	Quincy traffic, King Air one one two seven Delta's taxiing out uh, takeoff on runway four, Quincy.
1655:22	HOT-1	Quincy twaffic.
1655:26	HOT-2	sounds like a little kid.
1655:29	HOT-1	Qwincy twaffic. [sound of chuckle] ... he's a little baby, Elmer Fudd girl.
1655:40	7646J	Quincy traffic, Cherokee 7646 Juliet back-taxi uh, taxiing to runway four, Quincy.
1655:48	HOT-1	they're both using four.
1656:13	HOT-2	in sight.
1656:16	HOT-1	Okeydoky.
1656:21	RDO-1	Lakes Air two fifty one, Quincy in sight.
1656:26	CTR2	Lakes Air two fifty one cleared visual approach, Quincy.
1656:29	RDO-1	cleared for the visual Quincy for Lakes Air two fifty one.

“No further instructions were posted on the exterior of the airplane. The button above the handle was black, and it was located on a background color scheme of medium-hued blue. The button was not outlined. The FBO pilot said that he did not know that the proper procedure for opening the door involved depressing the button above the handle while simultaneously turning the handle.”

The Quincy Fire Department (QFD), which responded to the accident, received the initial notification at 1701. Two fire engines, seven firefighters and two other vehicles were dispatched to the accident scene at 1702. The first units arrived on the scene at 1714 when both aircraft already were engulfed in flames. The fire was extinguished with water.

The captain of Flight 5925, 30, had about 4,000 hours total flight time, of which 700 hours were as pilot-in-command of a Beech 1900C. She held an airline transport pilot (ATP) certificate for airplane multi-engine land and was type-rated in the Beech 1900C. Her Sept. 26, 1996, first-class medical certificate had no limitations.

The captain's most recent proficiency check and line check were in September 1996 and February 1996, respectively. Prior to the accident, she had flown 91 hours in the previous 30 days and 235 hours in the previous 90 days.

The first officer, 24, held a commercial pilot certificate with instrument ratings for single-engine and multi-engine airplanes and a first-class medical certificate with no limitations. At the time of the accident, he had about 1,950 total flight hours, 800 hours of which were as second-in-command of the Beech 1900C. In the 30- and 90-day periods before the accident, he had flown 103 hours and 233 hours, respectively.

A review of FAA records revealed no prior accidents, incidents or enforcement actions for either the captain or first officer.

The pilot of the King Air, 63, was a retired Trans World Airlines (TWA) captain. Employed by TWA from 1965 until 1992, he was type-rated in several aircraft. He also held a flight engineer certificate for both turbojet and reciprocating-engine aircraft, and was a certified flight instructor for single- and multi-engine airplanes with instrument ratings.

Of the King Air pilot, the report said, “He held a first-class medical certificate, dated June 11, 1996, with the restriction that he wear corrective lenses. He was seen wearing glasses when he boarded the airplane before the accident. According to the FAA, he had a waiver allowing him to use the tranquilizer/sedative Ativan (a benzodiazepine that is generally known as lorazepam) so long as he used it no more than two [times] to four times per month for sleep, and not within 18 hours of flying.”

At the time of the accident, the King Air pilot had 25,648 hours of flight time, of which 22 hours were in the King Air. His last

Part 135 proficiency check was in July 1996, and he was current in accordance with Part 91.

The report said, “The [King Air] pilot had been involved in a gear-up landing incident in a Cessna 172RG on May 26, 1996, while giving instruction to a student commercial pilot. As a result of that incident, the FAA initiated an enforcement action against him, but subsequently allowed him to take remedial training in place of the enforcement action. That training had not been completed at the time of this accident.

“The FAA inspector who investigated the gear-up incident said in a written statement to the [NTSB] that the pilot ‘expressed an extremely negative attitude toward the FAA’s questioning him about this landing. His statements were to the effect that he was a retired U.S. Air Force colonel with almost 30,000 hour[s] of flying time and that landing gear-up did not mean anything.”

The NTSB interviewed several pilots who had received flight instruction from the King Air pilot. Included was the student pilot involved in the gear-up landing, who said that, in his opinion, the King Air pilot’s shortcoming as an instructor was that he seemed to be in a hurry.

The report said, “Two of the passengers who had flown with the King Air pilot just before the accident commented that he seemed ‘to be in a hurry’ or ‘anxious to get home’ when he left them after the return flight to Quincy.

“TWA records indicated that on Oct. 7, 1991, the [King Air] pilot was transferred from the status of captain to that of flight engineer. A TWA instructor involved in that action told [NTSB] investigators that the transfer was made because of flying deficiencies observed in the pilot’s training, which resulted in a failed proficiency check and a failed special line check.”

The passenger-pilot, who was reportedly flying in a King Air for the first time, was a relatively experienced aviator, with a commercial pilot certificate with ratings for airplane single-engine land and sea, airplane multi-engine land and instrument airplane. She was a certified flight instructor, and also held a ground-instructor certificate with advanced and instrument ratings. She had a total of 1,462 flight hours; her most recent proficiency check was on June 28, 1996.

The King Air passenger-pilot was employed by FlightSafety International as a ground instructor. She was also a part-time flight instructor at the Scott U.S. Air Force Base Aero Club, Belleville, Illinois.

The Beech 1900C was leased by Great Lakes Aviation from Raytheon Aircraft Credit Association. It was manufactured by Beech Aircraft (now Raytheon Aircraft Co.) in 1989.

At the time of the accident, the airframe had 18,446 hours and 26,797 cycles. The left engine had 16,821 total hours and

1656:42 HOT-1 landing on one three, right?
1656:43 HOT-2 what’s that?
1656:44 HOT-1 you’re planning on one three still, right?
1656:46 HOT-2 yeah, unless it doesn’t look good then we’ll just do a downwind for four but uh, right now plan one three.
1656:56 RDO-1 Quincy area traffic, Lakes Air two fifty one is a Beech airliner currently ten miles to the north of the field. we’ll be inbound to enter on a left base for runway one three at Quincy any other traffic please advise.
1657:20 HOT-2 descent checklist.
1657:21 HOT-1 ice protection?
1657:22 HOT-2 standard three, boards any time.
1657:27 HOT-1 and the uh ... pressurization?
1657:33 HOT-2 that’s set checked.
1657:35 HOT-1 antiiii ... altimeter, three zero zero zero.
1657:38 HOT-2 set right.
1657:40 HOT-1 passenger brief?
1657:42 HOT-2 they’re, taken care of.
1657:45 HOT-1 and the landing and logo lights?
1657:47 HOT-2 they’re on.
1657:49 HOT-1 fuel balance?
1657:50 HOT-2 checked.
1657:51 HOT-1 oops ... I’d better balance ... and the um, auto-feather?
1657:58 HOT-2 armed.
1657:59 HOT-1 anti-skid?
1658:01 HOT-2 not installed.
1658:03 HOT-1 and the checklist?
1658:04 HOT-2 complete.
1658:05 HOT-1 approach briefing?
1658:08 HOT-2 complete.
1658:11 HOT-1 and performance is gonna be one zero ... uh one ten VYSE blue line.
1658:17 HOT-2 reviewed.
1658:19 HOT-1 nav radios?
1658:20 HOT-2 set right.
1658:21 HOT-1 set left interior lights?
1658:27 HOT-2 on.
1658:28 HOT-1 and theeeee, * flaps?

1658:32 HOT-2 holding up for right now.

1658:41 CTR2 * two fifty one, cleared visual approach at Quincy. report leaving three thousand.

1658:45 RDO-1 Lakes Air two fifty one we're already cleared for the visual at Quincy um, before you switched and uh, we're currently out of two thousand three hundred.

1658:54 CTR2 Lakes Air two fifty one roger. radar service is terminated, change to advisory frequency is approved. report the cancellation or down time on this frequency.

1659:02 RDO-1 over to advisory ...

1659:03 1127D4 [this transmission heard on both pilots' radio channels] Quincy traffic, King Air one one two seven Delta holding short of runway four. be, uh, takin' the runway for departure and heading uh, southeast, Quincy.

1659:04 RDO-1 ... we'll uh, cancel on the ground with you and cleared for the visual for Lakes two fifty one, good night.

1659:14 HOT-1 does sound little, doesn't she.

1659:15 HOT-2 takeoff flaps.

1659:19 HOT-1 she's takin' runway four right now?

1659:22 HOT-2 yeah.

1659:29 RDO-1 Quincy area traffic, Lakes Air two fifty one is a Beech airliner currently uh, just about to turn, about a six mile final for runway uh, one three, more like a five mile final for runway one three at Quincy.

1659:42 HOT-2 gear down.

1659:50 HOT-2 landing checks.

1659:52 HOT-1 landing gear?

1659:52 HOT-2 down three green.

1659:54 HOT-1 * is.

1659:57 HOT-2 flaps approach.

1659:59 HOT-1 full indicated.

1700:12 HOT-M five hundred.

1700:16 RDO-1 and Quincy traffic Lakes Air two fifty one's, on short final for runway one three um, the aircraft gonna hold in position on runway four or you guys gonna take off?

1700:28 7646J seven six four six Juliet uh, holding uh, for departure on runway four.

1700:34 HOT-M two hundred.

18,701 cycles; the right engine had 14,535 total hours and 19,291 cycles. A review of the aircraft's maintenance logs revealed no noteworthy discrepancies.

Emergency egress from the aircraft was through four exits. Viewed from aft looking forward, they were: an air-stair door on the left, which was also the main boarding door; an overwing hatch on the left; and two overwing hatches on the right.

The report said, "According to maintenance records, on April 27, 1996, Great Lakes performed a detailed inspection (including opening) of the air-stair door, the overwing exits, and the [exterior] cargo door. No discrepancies were noted."

The King Air was built by Beech Aircraft in 1967. It was powered by two Pratt & Whitney PT6A-20 turboprop engines. The airplane had two exits: an air-stair door in the aft cabin on the pilot's side, and an overwing emergency exit opposite.

At the time of the accident, the King Air had 11,392 total flight hours. On July 15, 1996, when a 150-hour primary inspection was made, the left engine had 9,278 hours total time and the right engine had 9,363 hours total time. The maintenance records did not record engine cycles.

The report said, "The examination of airframe logbooks did not reveal any abnormalities or entries concerning the airplane's communication equipment. ...

"On the King Air's earlier flight from Tulsa [Oklahoma, U.S.] to Quincy, the ground controller at Tulsa reportedly commented on the quality of the King Air's radios, and the clearance delivery controller was unable to receive transmissions made by the passenger-pilot.

"However, communications with air traffic controllers at the Kansas City [Missouri, U.S.] air-route traffic-control center (ARTCC), who were responsible for aircraft in the Quincy area, did not indicate any difficulties with radio communications. The ARTCC was in contact with the King Air from about 1443 to 1620."

One of the King Air passengers on the flight from Tulsa recalled that the pilot and the passenger-pilot had, at one time or another, exchanged headsets and microphones because of faulty performance of the equipment.

Weather at the time of the accident was clear, with a ceiling of (3,965 meters) 13,000 feet and visibility of (16 kilometers) 10 miles. Wind was from 060 degrees at (18.5 kilometers per hour) 10 knots.

There were no known difficulties with aids to navigation.

The Beech 1900C was not equipped with a flight data recorder (FDR), and the equipment was not required. The King Air did

not have a FDR or a cockpit voice recorder (CVR), nor was the aircraft required to have them.

The Beech 1900C had a CVR, but the report said, “The Beech 1900c’s CVR recording of the outgoing radio transmissions was faint and of poor quality. As a result, the [NTSB] had difficulty determining the content of all transmissions.

“In its May 22, 1997, letter to the FAA, the [NTSB] issued Safety Recommendation A-97-36, which asked the FAA to do the following:

Promptly require the inspection of the CVR and associated equipment on all Beech 1900C aircraft and ensure that operators take corrective action to repair deficient CVR systems so that the intelligibility of recorded communications, including radio transmissions to and from the airplane, is as high as practicable.”

The report said, “Toxicological tests were conducted on fluid and tissue samples of all four pilots. Tests conducted on urine samples for benzodiazepines, alcohol and other drugs were negative for all of them except the King Air pilot. Lorazepam (a benzodiazepine) was detected in the King Air pilot’s urine sample, but it was not detected in his blood or liver fluid samples.”

On Jan. 3, 1997, the NTSB issued urgent Safety Recommendation (SR) A-97-1, which asked FAA to issue a telegraphic airworthiness directive (AD) directing operators of Beech 1900C aircraft to highlight the door-opening button, indicate that the button must be depressed while the handle is being rotated and include an arrow showing which way the handle must be moved to open the door.

One month later, Raytheon Aircraft Co. complied by issuing Service Bulletin (SB) no. 2741; and on April 25, 1997, the NTSB marked SR A-97-1 as “Closed — acceptable action.”

The NTSB has issued two previous safety recommendations concerning the external operation of emergency exits. One (March 1981) followed a series of Piper PA-28 accidents in which attempts by rescuers to break windows or open cabin doors to rescue surviving occupants were not successful. The catalyst for the other (March 1980) was a Beechcraft Super King Air 200 accident in which the pilot and four passengers, having survived the accident, died from smoke and fire-related injuries because they were unable to escape through the emergency exits.

The two previous NTSB safety recommendations required, and discussed the means for, conspicuously marking the location of external doors and emergency exits and prominently displaying the instructions for opening them.

1700:35 7646J ... * on the uh, King Air.
1700:37 RDO-1 OK, we’ll, we’ll get through your intersection in just a second, sir * we appreciate that.
1700:42 HOT-1 landing gear’s down three green, flaps are at landing. your yaw damp is off. finals are complete.
1700:48 HOT-1 we kinda ...
1700:49 HOT-2 kinda what?
1700:50 HOT-1 we kinda fudged, in there a little.
1700:59 CAM [sound similar to aircraft touching down on runway]
1701:01 HOT-1 max reverse.
1701:01 HOT-1 oh #.
1701:03 HOT-2 what, oooooh #.
1701:07 HOT-2 oh # me.
1701:08 [End of recording and transcript]

HOT = Crew member hot microphone voice or sound source
HOT-M = Aircraft mechanical voice heard on all channels
RDO = Radio transmission from accident aircraft
CAM = Cockpit area microphone voice or sound source
CTR2 = Radio transmission from Kansas City Center controller
1127D4 = Radio transmission from King Air in female voice
7646J = Radio transmission from Cherokee
-B = Sounds heard though both pilots’ hot microphone systems
-1 = Voice identified as pilot-in-command
-2 = Voice identified as copilot
-? = Voice unidentified
***** = Unintelligible word
@ = Nonpertinent word
= Expletive
— = Break in continuity
() = Questionable insertion
[] = Editorial insertion
... = Pause

Source: U.S. National Transportation Safety Board

There is an aircraft rescue and fire-fighting (ARFF) truck at Quincy Airport, but it is staffed by QFD firefighters only during air-carrier operations.

“[FARs] Part 139.3 defines air-carrier operations as the ‘takeoff and landing of an air-carrier aircraft [with a seating capacity of more than 30 passengers] and includes the period of time from 15 minutes before and until 15 minutes after the takeoff or landing,” said the report, “The truck at the airport was not staffed at the time of the accident because no air-carrier aircraft with more than 30 passenger seats [was] landing or taking off.”

The NTSB investigated the possibility that conspicuity or visibility may have played a role in the collision, particularly the ability of the King Air pilot and his passenger-pilot to see the approaching Beech 1900C in the sunset/dusk conditions.

The report said, “On Nov. 22, 1996, between 1637 and 1708, at dusk in weather conditions similar to those at the time of the accident, and with the sunset behind them, two investigators positioned themselves in an airport service truck in the runup area at the approach end of Runway 04 facing in the direction of the King Air’s takeoff roll. At 1648, they observed ... a King Air C90 fly overhead, make a downwind entry and land on Runway 13. The strobe and landing lights of the airplane were observed to be conspicuous during the sequence, and there were no obstructions to visibility.”

During that same period, the two investigators watched a twin-engine turboprop Cessna Conquest and a twin-turbojet powered Dassault Falcon taxi out and take off on Runway 13. Strobe and landing lights were conspicuous on both aircraft, and there were no obstructions to visibility.

“Additional visibility tests involving a Beech 1900C were conducted on Nov. 22, 1996, between 1800 and 1930,” said the report. “The Beech 1900C ... took off, performed a left pattern and landed on Runway 13, while another investigator observed from the left seat of a King Air B90 positioned on Runway 04 in the approximate takeoff position of the accident [King Air].

“During the Beech 1900C’s landing sequence on final approach and touchdown, the investigator in the King Air observed obstructions to his direct view of the Beech 1900C caused by the rear side-window post in the King Air for most of the landing sequence on short final.”

Two other tests were made with the King Air taxiing rapidly toward the accident site as the Beech 1900C descended below 200 feet above ground level on its approach to Runway 13. The report said, “In both tests, the Beech 1900C appeared to be close to the King Air captain’s forward window post. No surface obstructions to visibility were observed in either test.”

Photographs provided to NTSB by Raytheon represented the views from the cockpits of both of the aircraft involved in the

accident. The report said, “The [NTSB] study of the photographs ... indicated that the view of the King Air from the Beech 1900C captain’s position would have been partially obstructed by the center post and windshield wipers during the airplane’s final approach and would have been totally obscured by the center post for six seconds starting at about 1700:43.

“Approximately 10 seconds before touchdown ... until the time of the collision, the captain would have had a partially obscured view of the King Air through the first officer’s front windshield.

“The view [of the King Air] from the Beech 1900C first officer’s position would have been partially obstructed by the first officer’s side posts for nearly 30 seconds before touchdown until impact, including six seconds starting at 17:00:42 when the first officer’s view of the King Air would have been totally obstructed by the front windshield side post.”

The view of the Beech 1900C from the left seat of the King Air would have been fully or partially obstructed from about four seconds before the King Air began its takeoff roll (1700:40) until 1700:54; and, except for two seconds just before impact, the view of the Beech 1900C from the left seat of the King Air would have been fully obstructed from 1700:54 until the collision at 17:01:09.

The view of the occupant of the right seat in the King Air would have been partially obstructed until just before the beginning of the King Air’s takeoff roll. At 1700:39, the Beech 1900C would have been in clear view through the left front windscreen and would have remained in view until the beginning of engine throttle back by the King Air pilot.

The report said, “It was noted that when the [King Air] right-seat occupant’s view would have been obstructed, the left-seat occupant’s view would have been clear, and vice versa.”

Great Lakes Aviation is a regional airline. The airline was founded in 1997 and, at the time of the accident, had more than 1,200 employees, including 328 pilots. The airline operated a fleet of 44 Beechcraft 1900Cs and 12 Embraer EMB-120s, providing scheduled service to 87 destinations in the United States and Mexico.

“The FAA principal operations inspector for Great Lakes stated that her relationship with [Great Lakes Aviation] was good and that she was unaware of any complaints by pilots,” the report said. “She stated that a National Aviation Safety Inspection Program review of the company was conducted in June 1995, and that there were no major findings. She noted that when she had conducted type-rating check rides en route to Quincy, company pilots had used appropriate calls and procedures for landing, and that the carrier served a high

“It was noted that when the [King Air] right-seat occupant’s view would have been obstructed, the left-seat occupant’s view would have been clear, and vice versa.”

number of uncontrolled airports. She stated that she had personally observed a recurrent training class that addressed the issues of uncontrolled airports and procedures. (See "Operating in the Vicinity of an Uncontrolled Airport.")

"Great Lakes Aviation voluntarily suspended flight operations on May 16, 1997, after the FAA identified discrepancies in the airline's maintenance operations. According to the FAA, the suspension was unrelated to this accident. On June 23, 1997, the company resumed limited service; and, according to the FAA, as of July 1, 1997, it was operating 18 of its airplanes on 18 routes into 26 cities."

NTSB's analysis of the accident considered the performance of the Beech 1900C flight crew, the performance of the pilot and passenger-pilot in the King Air, the actions of the Cherokee pilot, the accident's survival aspects, the operation of the Beech

1900C emergency exits and the accident response of the Quincy fire-fighting and rescue crews.

The crew of Flight 5925 briefed the passengers on emergency procedures as the flight departed Burlington for Quincy. The report said, "At 1638:12, the CVR recorded a flight crew-activated prerecorded passenger briefing. ... The prerecorded briefing stated the following, in part:

Please remove the passenger briefing card located in the seat pocket in front of you. We suggest that you follow along as we explain the location and operation of the aircraft's safety equipment.

Passengers seated in 4C, 6A or 6C should review the information card explaining exit-row seating requirements. If you feel you would be unable to

Conducting Flight Operations at an Uncontrolled Airport

The U.S. National Transportation Safety Board's (NTSB's) official accident report on the Nov. 19, 1996, fatal collision of two aircraft at Quincy, Illinois, U.S., said, quoting the *Aeronautical Information Manual (AIM)*, "There is no substitute for alertness while in the vicinity of an [uncontrolled] airport. It is essential that pilots be alert and look for other traffic and exchange traffic information when approaching or departing an airport without an operating control tower.

"This is of particular importance since other aircraft may not have communication capability or, in some cases, pilots may not communicate their presence or intentions when operating into or out of such airports. To achieve the greatest degree of safety, it is essential that all radio-equipped aircraft transmit/receive on a common frequency [common traffic advisory frequency (CTAF)] identified for the purpose of airport advisories."

Unless regulations or local procedures dictate otherwise, pilots of departing aircraft should monitor and communicate on CTAF during startup, during taxi and until (16 kilometers) 10 miles from the airport after takeoff. Pilots of inbound aircraft should monitor and communicate on CTAF from 16 kilometers out to landing.

Recommended times for CTAF traffic messages are:

- For outbound aircraft: before initial taxi and before taxiing onto the duty runway;
- For inbound aircraft: 16 kilometers out, entering downwind leg, base leg, final and when leaving the duty runway after landing.

With regard to traffic patterns at uncontrolled airports, the report said, "The FAA encourages pilots to use the

standard traffic pattern. However, for those pilots who choose to execute a straight-in approach, maneuvering for and execution of the approach should be completed so as not to disrupt the flow of arriving and departing traffic. Therefore, pilots operating in the traffic pattern should be alert at all times to aircraft executing straight-in approaches. ...

"Aircraft, while on final approach to land or while landing, have the right-of-way over other aircraft in flight or operating on the surface. ...

"Pilots are reminded of the requirement to move one's head ... to search around the physical obstructions, such as door and window posts. The doorpost can cover a considerable amount of sky, but a small head movement may uncover an area which might be concealing a threat.

"Prior to taxiing onto a runway or landing area for takeoff, scan the approach areas for possible landing traffic by maneuvering the aircraft to provide a clear view of such areas."

High-speed runway collisions involving an aircraft in commercial service are extraordinary.

"Only two such accidents occurred during the last five-full-year period," the report said, "and those accidents occurred at airports with an operating tower. The data [do] not indicate that the recommended practices, procedures and services currently being used to prevent aircraft collisions in the airport environment are systematically inadequate."♦

carry out these instructions or wish to be reseated, please notify a crew member.

There are four exits aboard this aircraft. There are three clearly marked overwing exits, two over the right wing and one over the left wing. To open, pull down on the handle and pull the exit inward. The main cabin door through which you entered is also an emergency exit. To open, push the button next to the door handle then rotate the handle counterclockwise and push the door open."

As they neared Quincy Municipal Airport, the crew of Flight 5925 made several radio transmissions on the CTAF, beginning (48 kilometers) 30 miles from the airport. The captain of Flight 5925 took the precaution of asking whether the airplane holding in position on Runway 04 was going to continue to hold or take off. When the Cherokee responded to the question, the captain of Flight 5925 believed that she was hearing the King Air crew.

"Subtle cues indicated that the transmission did not come from the King Air," said the report. "Specifically, the speaker gave a different 'N' [aircraft registration] number, and the [male] voice ... of the speaker [was] different than heard in the previous transmissions [in female voice] from the King Air. ... The Cherokee pilot stated that all the transmissions from both the Beech 1900C and the King Air were in female voices.

"However, because the [Beech 1900C] pilots were most likely preoccupied with landing the airplane, and because the speaker said 'King Air' and did not say 'Cherokee,' and the pilots had no reason to expect a response from any aircraft other than the King Air, they probably did not notice or focus on those cues."

"The Beech 1900C was visible to other airport traffic during its approach. Witnesses, including the occupants of the Cherokee taxiing behind the King Air, said that they could see the airplane and that it had its landing lights on."

The Beech 1900C touched down on Runway 13 at 1700:59. At 1701:01, the captain called for "Max reverse," suggesting that she saw the King Air at that time. Skids marks indicate that maximum braking began three seconds later and continued until the impact at 1701:09.

Aboard the King Air, the report said, "There were several indications that the pilot may have been giving instruction to the passenger-pilot The pilot had instructed her in the past, and this was the first time the passenger-pilot had flown a King Air. ... The King Air's one-minute delay after taxiing onto the runway before power was applied for takeoff is consistent with instruction. ...

"Although [the King Air] had been sitting on Runway 04 for about one minute, the King Air pilot began the takeoff without making a takeoff announcement over the CTAF. ... Such an announcement would have afforded the Beech 1900C flight crew the opportunity to take evasive action.

"Because no pilot would take off knowing that another airplane was about to land on an intersecting runway, the occupants of the King Air must have been unaware at the time they began their takeoff roll that an airplane was about to land."

This lack of awareness could have derived from three sources: failure of the King Air pilots to monitor the CTAF, mechanical radio problems or the setting of the radio controls on the King Air so the flight crew could transmit but not receive.

The report said, "Had the occupants of the King Air been monitoring the CTAF, they should have heard the four announcements from Flight 5925 indicating that the airplane was inbound to Quincy and was planning to land on Runway 13. ...

"Because of the extensive fire damage, the settings on the radios at the time of the accident could not be determined."

***"The King Air pilot
began the takeoff
without making a
takeoff announcement
over the CTAF."***

Witnesses said that the Beech 1900C was visible at least (16 kilometers) 10 miles from the airport, which would have been about four minutes before the aircraft touched down. Although the NTSB visibility study indicated that the Beech 1900C would have been obstructed from view from inside the King Air cockpit during much of its final approach and landing, the NTSB said that the Beech 1900C would have been visible if the

occupants of the King Air had moved their heads or bodies while scanning outside the cockpit.

"If they had done so ... during the last four minutes of the airplane's approach, they would have been able to see the incoming airplane and would not have commenced their takeoff roll when they did," said the report.

The report said that the King Air pilot's gear-up incident during an instructional flight and his demotion from captain to flight engineer at the end of his TWA career suggest that he may not have placed enough emphasis on flight safety. The King Air pilot might have been in a hurry that afternoon.

"After the King Air pilot returned to Quincy, two of the passengers said that he seemed to be ... 'anxious to get home,'" the report said. Further, the accident happened near 1700, which is a time of day often associated with fatigue.

The report said, "According to the pilot's wife, he slept normally in the days before the accident but awoke earlier

than his usual time of 0800 on the day of the accident. The detection of lorazepam in the pilot's urine indicates that he ingested the medication in the previous days or weeks. However, the absence of the medication in his blood indicates that he was not impaired by the medication at the time of the accident.

"Nevertheless, his potentially recent use of the medication suggests that he may have had some difficulty sleeping. Based on his early wakeup time, the time of day that the accident occurred and the possibility that he had difficulty sleeping recently, he was most likely not at his peak alertness at the time of the accident.

"A combination of these factors (preoccupation with providing instruction to the [passenger-pilot], careless habits, possible fatigue and rushing) could explain why the King Air pilot did not properly scan for traffic."

The performance of the Cherokee pilot, who had only 80 hours of flight time, reflected his inexperience. He used the term "back taxi" incorrectly. (It means taxiing on a runway in a direction opposite to the traffic flow.) He responded to a radio transmission that was not directed to him, and in the transmission he failed to precede his "N" number with the aircraft model (Cherokee). He then failed to correct the resulting misunderstanding.

The report said, "The Cherokee's pilot's response to Flight 5925's question (directed to the airplane in position on Runway 04) was unnecessary and inappropriate because he was not the first in line for takeoff. If he did not understand the transmission and thought a pilot from the King Air was talking to him, which they would have had no apparent reason to do, he should have asked for clarification before answering. In any event, if the Cherokee pilot did not know that he was responding to the Beech 1900C flight crew's request, he should have realized that his transmission could be misinterpreted or could create confusion.

"Both the Cherokee pilot and the passenger saw the two airplanes converging. The Cherokee pilot had the opportunity to alert the pilots in the Beech 1900C to the situation, and it would have been prudent for him to do so. It should have been apparent from the Beech 1900C's approach path, which would have been at about a 90-degree angle to Runway 04, that the runways intersected. Nonetheless, the Cherokee pilot stated that he did not realize [that] the runways intersected. The Cherokee passenger said that he thought the airplanes would miss each other."

Autopsies done on the occupants of both accident airplanes revealed that they died from carbon monoxide intoxication from inhaling smoke and soot or other combustion products

from the postaccident fire. The occupants did not sustain typical blunt-force injuries that would have impeded their ability to move about or evacuate the airplane.

The report said, "The bodies of the King Air's occupants were found behind the seats in the cockpit, indicating that they were overcome by the effects of the fire before reaching an exit."

Great Lakes Aviation's operating manual addressed "unplanned immediate action" during an obvious emergency. The manual instructs crew members to shout, "Unfasten seat belts and get out" after the airplane has come to a complete stop.

The report said, "The manual indicates that a 'crew member will then open a usable exit (main-cabin door) and direct opening of other exits.' The manual includes the following instructions for an unusable exit:

Do not waste time at an exit that will not open and is not going to get anyone out. Assign an able-bodied person ... to redirect everyone to an appropriate alternate exit.

"The Cherokee pilot had the opportunity to alert the pilots in the Beech 1900C to the situation, and it would have been prudent for him to do so."

"The body of Flight 5925's first officer was found between the air-stair door and the forward right overwing exit. The exterior air-stair door handle was in the unlocked position when the first people reached the accident scene, suggesting that the first officer followed company evacuation procedures and initially tried to open the air stair door but was unable to do so.

"Because the right overwing exits were near the fire on the right side of the cabin, he [then] most likely proceeded toward the left overwing exit but was overcome by the effects of smoke and fire before he could reach it. The rescuers did not observe any smoke coming from the left overwing exit, indicating that it was not opened.

"The most recent emergency training of the captain of Flight 5925 was completed during her captain upgrade training on Feb. 5, 1996. It included ground evacuation and drills on emergency exits. The first officer's most recent emergency training and emergency drills were completed on Aug. 6, 1996."

Figure 2 (page 12) shows a drawing of the Beech 1900C air-stair door and latching mechanism, viewed from inside the aircraft.

The air-stair door has six cam locks, three on each side of the door. A continuous cable connects the six cam locks with the interior and exterior door handles. When the door is closed and locked, the cams contact the door frame. When a door

handle is turned, the cable rotates each cam about 150 degrees, removing the cams' contact with the door frame and unlocking the door.

To unlock the door from inside or outside, a release button must be depressed before the door handle can be rotated. The release button acts as a safety device, to prevent accidental opening of the door.

The report said, "According to representatives of Raytheon, if there is more than [0.64 centimeter] 0.25 inch of slack in the cable, the cam locks may not fully rotate when the handle is rotated.

"The air-stair door parts from the accident airplane were examined at the [NTSB] Materials Laboratory on Jan. 30, 1997. The findings of the examination were as follows:

- "1. All cams were either fully or partially latched;
- "2. The exterior door handle was frozen in the latched position with aluminum melted around it;

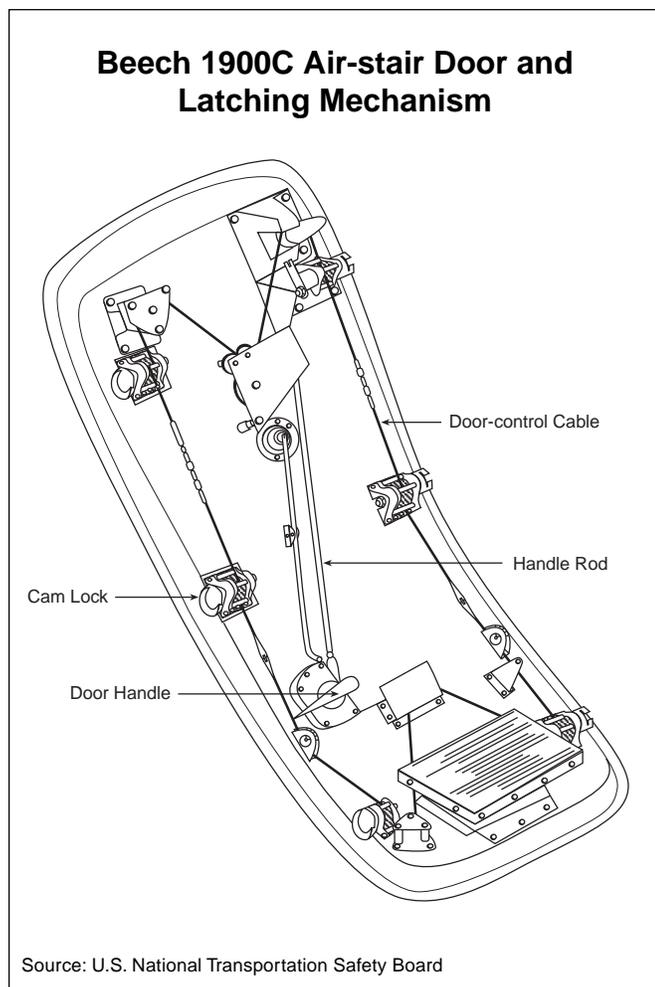


Figure 2

"3. The position of the interior door handle assembly could not be determined because there was no frame of reference to compare to surrounding structure;

"4. The door-control cable was attached at both handle assemblies and was fractured at both turnbuckles. The metallurgical examination of the turnbuckle surfaces revealed a topography typical of copper alloys subject to static failure influenced by high temperatures and steady-state strain rates."

The two overwing exit hatches, one on each side of the cabin, are plug-type doors that remove completely from the fuselage frame into the cabin when they are opened. The hatches are released from the inside with a pull-down handle marked "Exit — Pull." A window placard at the overwing exits has instructions, "Push seat backs to clear exit."

From the outside, the hatches are released with a flush-mounted, pull-out handle.

The report said, "During the investigation, [NTSB] investigators opened a Beech 1900C overwing exit while two persons were in the seats next to the hatch. An investigator was able to pull the exit into the cabin even though the seats were occupied and the seat backs were not pushed forward to clear the exit.

"During wreckage recovery, the overwing exit hatch-release latches and turnbuckles were examined. No conclusion could be drawn regarding their positions before the postcrash fire because the release latch secured to the airframe could have fallen from its latched position when the surrounding structure burned away."

The report said that the airplanes initially came to rest on their landing gear and that the occupants of the Beech 1900C sustained few or no injuries. Nevertheless, concern was expressed that sufficient forces could have been created to cause the Beech 1900C air-stair door to jam.

The report said, "If the impact caused deformation of the door and/or the fuselage that prevented one or more of the cam locks from moving, it would not have been possible for the exterior door control handle to be moved from the closed position to the open position as easily as it was described to have been done by the United Express pilot who tried to open the air-stair door from the outside.

"However, if the impact caused deformation of the door/frame system that introduced slack into the cable system, the exterior handle could have been moved from the closed to the open position, but the cable would not necessarily simultaneously rotate all the cam locks to the completely open position. This would explain why the FBO pilot found the door handle in the unlocked position when he first arrived but could not open the door."

The air-stair door on the Beech 1900C was certificated by the FAA as having met the current freedom-from-jamming requirements. (See “Certification of the Air-Stair Door Emergency Exit.”) As a part of the accident investigation, the NTSB attempted to analyze the adequacy of those requirements.

The report said, “Although the requirement that doors be reasonably free from jamming as a result of fuselage deformation is stated in at least three applicable regulation ... two of which existed at the time the Beech 1900C was certificated, there is apparently no clear guidance indicating how a manufacturer should demonstrate compliance with these requirements.

“Specifically, there appears to be no clear written guidance from the FAA specifying the degree of fuselage deformation

contemplated by those regulations, or what is meant by ‘reasonably free’ from jamming. Although Beech requested and received FAA approval of the specific tests it used to show compliance and conducted additional ‘unofficial’ tests to demonstrate freedom from jamming in a particular accident configuration over which the FAA had expressed concern (both main gears collapsed), there is apparently no specific written FAA standard against which a manufacturer’s compliance is to be measured.”

The NTSB also considered the possibility that the door cable was improperly routed by a maintenance technician at Great Lakes Aviation. Such a situation might not be evident immediately. But, over time, improper routing of the cable could lead to the cable’s binding or loosening, and that could have prevented the door from operating properly. No evidence was found that the cable was misrouted.

Beech Air-stair Door Emergency Exit Certified in 1983

The Beechcraft 1900C aircraft received its initial type certification on Nov. 22, 1983. In certifying the Beech 1900C, the U.S. Federal Aviation Administration (FAA) observed the testing of the air-stair door and found that it complied with the requirement for freedom-from-jamming certification.

The report said, “Regulatory requirements ^{1,2,3} pertaining to door jamming applicable to the certification of the Beech 1900C ... stated that each emergency exit ‘must have reasonable provisions against jamming by fuselage deformation’ ... and that ‘each external door must be reasonably free from jamming as a result of fuselage deformation in a minor crash.’

“[NTSB] investigators reviewed the Beech Model 1900/1900C Engineering Structural Test reports ... which detailed testing that Beechcraft used for the type certification of the 1900C airplane. According to the reports, fuselage static tests were conducted at Beech Aircraft in Wichita, Kansas [U.S.] ... as part of the overall structural static test certification program for the Beech Model 1900C forward fuselage and standard version 1900C fuselage.”

These static tests included side shear and side bending torque, up-bending and up shear, down-bending and down shear, shear between spars and side shear between spars. In the test aircraft, the report said, “The tests ... [produced] the following results: a [9.4-centimeter] 3.70-inch crack in the lower aft corner of the air stair frame ... ; buckling of the aft lower corner of the right-hand nose door, door frame and floor frame ... ; wrinkling of the fuselage skin ... ; loosening of the sealer [and] the forward spar; and the shearing of two raised rivet heads at the forward spar.”

After the completion of these static tests, FAA representatives visited the Beech test facility and witnessed the opening of the forward air-stair door and overwing emergency hatches on the Beech 1900C and Beech 1900C test fuselages. The report said, “The doors opened without jamming or structural failure.

“In a letter to Beech Aircraft Corp. dated Sept. 12, 1983, the ACO [FAA aircraft certification office] stated that the findings from this demonstration showed compliance with [federal regulatory requirements]. It further stated that, based on the results of an ‘unofficial static test conducted at Beech on Jan. 25, 1983, ... [which] show the entry door to be reasonably free from jamming when the fuselage is loaded corresponding to the most critical condition of landing gear collapse (both mains collapsed),’ the ACO ‘is satisfied that no unsafe condition is identified with regard to entry door jamming.’”

After the Beech 1900C had been certificated, the FAA provided further guidance for complying with federal door design standards in Advisory Circular (AC) 25.783-1, dated Dec. 10, 1986. The AC said:

“8. Door Jam Condition.

“An external door, exit or hatch which may be used for emergency exit in a crash should be designed to allow for fuselage distortion likely to result from a minor crash. This is usually achieved by allowing sufficient clearance between the door and the surrounding fuselage support structure to accommodate likely distortions. Also, the possibility of distortion in the door cutout should be minimized by designing the door cutout frame with more strength than that of the surrounding structure.”◆

Of the emergency response to the accident, the report said, “The Quincy Fire Department ... took about 14 minutes for its firefighting units to arrive. ... Witnesses observed that the fire was burning on the right side of the Beech 1900C, about [550 meters] 1,800 feet from the airport’s [unmanned] ARFF truck.

“If properly staffed, that truck should have been able to reach the accident site in no more than one minute. Firefighters might then have been able to extinguish or control the fire, thereby extending the survival time for at least some of the occupants of the Beech 1900C. Those occupants might have then had time to escape through the overwing exit hatch.”

Based on its investigation, the NTSB reached the following conclusions:

- “The pilots of Flight 5925 were properly certificated, trained and qualified for their duties in accordance with [FARs] Parts 61 and 135 and company requirements;
- “The pilot of the King Air was properly certificated under 14 CFR Part 61;
- “The Beech 1900C was equipped and maintained in accordance with applicable rules and directives;
- “No records were found to indicate that the King Air had undergone the required transponder and pitot static inspections within the past two years. Other than this possible maintenance deficiency, which was not a factor in the accident, the King Air was maintained in accordance with applicable rules and directives;
- “Weather was not a factor in the accident;
- “Given the Beech 1900C flight crew’s frequent radio broadcasts of the airplane’s position during the approach, and the lack of any prohibition on straight-in approaches to uncontrolled airports, the flight crew’s decision to fly a straight-in approach to Runway 13 was not inappropriate;
- “The flight crew of Flight 5925 made appropriate efforts to coordinate the approach and landing through radio communications and visual monitoring; however, they mistook the Cherokee pilot’s transmission (that he was holding for departure on Runway 04) as a response from the King Air to their request for the King Air’s intentions, and therefore mistakenly believed that the King Air was not planning to take off until after Flight 5925 had cleared the runway;
- “The failure of the King Air pilot to announce over the [CTAF] his intention to take off created a potential for collision between the two airplanes;

- “The occupants of the King Air did not hear the transmissions from Flight 5925 on the [CTAF]; it is likely that ... the King Air occupants did not properly configure the radio receiver switches to the [CTAF], or that they were preoccupied, distracted or inattentive;
- “The occupants of the King Air were inattentive to or distracted from their duty to ‘see and avoid’ other traffic;
- “The Cherokee pilot’s transmission in response to Flight 5925’s request was unnecessary and inappropriate and, combined with the lack of any correction to the flight crew’s misunderstanding, misled the flight crew into believing that it had been communicating with the King Air, and that the King Air would continue holding;
- “Because of the Cherokee pilot’s inexperience, he probably did not realize that a collision between the two airplanes was imminent, and therefore he did not broadcast a warning;
- “The impact forces were at a survivable level for the occupants of both airplanes;
- “The speed with which the fire enveloped the King Air and the intensity of the fire precluded survivability for the occupants of the King Air;
- “The occupants of the Beech 1900C did not escape because the air-stair door could not be opened, and the left overwing exit hatch was not opened;
- “The most likely reason that the air-stair door could not be opened is that the accident caused deformation of the door/frame system and created slack in the door-control cable;
- “The methods for showing compliance with the FAA’s certification requirement that external doors be reasonably free from jamming as a result of fuselage deformation are not clearly defined;
- “The FAA’s freedom-from-jamming certification standards may be inadequate;
- “Formal training for maintenance personnel in specific tasks they are assigned to accomplish is critical for the proper, sustained operation of aircraft;
- “If on-airport aircraft rescue and fire-fighting equipment protection had been required for this operation at Quincy Airport, lives might have been saved; [and,]
- “Although some communities may lack adequate funds to provide aircraft rescue and fire-fighting protection for small airports served by commuter airlines, commuter

airline passengers deserve the same degree of protection from postcrash fires as air-carrier passengers on aircraft with more than 30 passenger seats.”

As a result of the investigation of this accident, NTSB made the following recommendations to the FAA:

- “Reiterate to flight instructors the importance of emphasizing careful scanning techniques during pilot training and biennial flight reviews (A-97-102);
- “Evaluate the propensity of the Beech 1900C door/frame system to jam when it sustains minimal permanent door deformation and, based on the results of that evaluation, require appropriate design changes (A-97-103);
- “Establish clear and specific methods for showing compliance with the freedom-from-jamming certification requirements (A-97-104);
- “Consider the circumstances of the Nov. 19, 1996, Quincy, Illinois, accident when developing methods for showing compliance with freedom-from-jamming requirements, and determine whether it is feasible to require that doors be shown to be free from jamming after an impact of similar severity (A-97-105);
- “Review and improve, as necessary, guidance for principal maintenance inspectors to use in ensuring that maintenance personnel are properly trained in accomplishing the maintenance tasks that they are assigned (A-97-106);
- “Develop ways to fund airports that are served by scheduled passenger operations on aircraft having 10 or more passenger seats, and require these airports to ensure

that [ARFF] units with trained personnel are available during commuter flight operations and are capable of timely response (A-97-107); [and,]

- “Add to the Safety Information Section of the FAA’s Internet home page a list of airports that have scheduled air service but do not have [ARFF] capabilities (A-97-108).”

In addition, the NTSB reiterates to the FAA Safety Recommendation A-94-204:

“Permit scheduled passenger operation only at airports certificated under the standards contained in Part 139, ‘Certification and Operations: Land Airports Serving Certain Air Carriers.’”♦

Editorial note: This report was adapted from *Runway Collision, United Express Flight 5925 and Beechcraft King Air A90, Quincy Municipal Airport, Quincy, Illinois, U.S. on Nov. 19, 1996*. Report no. NTSB/AAR-97-04, July 1, 1997. The 88-page report contains figures, color photographs and appendixes.

References

1. U.S Federal Aviation Regulations (FARs), Part 23.807, “Emergency Exits.” Paragraph (b)(4) (Revised Jan. 1, 1997).
2. Special Federal Aviation Regulation (SFAR) 41C, *Doors and Exits*, paragraph 4c.
3. FARs Part 23.783, Subpart D, *Design and Construction*. Paragraph (c)(5) (Revised Jan. 1, 1997).



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