NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

Structures Group Chairman's Factual Report – October 2, 2006
DCA06MA064

A. ACCIDENT

Location:	Lexington, Kentucky
Date:	August 27, 2006
Time:	0607 Eastern Daylight Time
Airplane:	Bombardier CRJ Series 100, N431CA

B. STRUCTURES GROUP

Chairman:	Brian K. Murphy National Transportation Safety Board Aerospace Engineer – Airplane Structures Washington, DC
Member:	Charles Chrest Comair, Inc. Director Quality Control Erlanger, KY
Member:	Mark Potter Federal Aviation Administration CL-600-2B19 PPM Louisville, KY
Member:	Justin Gillmor ALPA Safety representative Burlington, KY
Member:	James Samuel IAMAW Flight Safety representative Crittenden, KY

C. SUMMARY

On August 27, 2006, about 0607 eastern daylight time, Comair flight 5191, a Bombardier CL-600-2B19 (CRJ-100), N431CA, crashed during takeoff from Blue Grass Airport, Lexington, Kentucky (LEX). The airplane, which had been cleared for runway 22, taxied onto runway 26 instead and ran off the end of runway 26. Of the 47 passengers and 3 crewmembers on board the airplane, 49 were killed, and 1 received serious injuries. The airplane was destroyed by impact forces and post crash fire. The flight was operating under the provisions of 14 Code of Federal Regulations Part 121 and was en route to Hartsfield-Jackson Atlanta International Airport, Atlanta, Georgia (ATL).

D. DETAILS OF THE INVESTIGATION

1.0 Accident Airplane

N-number:	N431CA
Airplane Serial Number:	7472
Airplane Manufacturer:	Bombardier, Inc.
Model:	CL-600-2B19
TCDS:	A21EA
Engine Manufacturer:	General Electric
Model:	CF-34-3A1
TCDS:	E15NE
Airplane Date of Mfr:	1/30/2001
Airworthiness Certificate:	Transport
Approved Operations:	121
Airplane Type:	Fixed Wing Multi-Engine
Engine Type:	Turbo fan
Airplane Category:	Transport
Number of Engines:	2
Number of Seats:	54 (50 passengers, 3 crew and 1 observer)
MGTOW:	53,000 lbs
Total Time[1]:	14536.2 flight hours
Total Cycles[1]	12048 flight cycles

[1] Airplane total time as of August 27, 2006

2.0 Accident Site

The geographic coordinates of the initial tree impact and the final location of the fuselage were N 38° 02′ 16″ latitude and W 84° 36′ 46″ longitude and N 38° 02′ 18″ latitude and W 84° 36′ 57″ longitude respectively.

3.0 Wreckage Debris (reference Attachment 1 for wreckage distribution diagram)

The airplane was destroyed by impact forces and consumed by a post-crash fire. The fuselage, left and right wings, engines, landing gear and empennage structure were identified along with all of the control surface structure at the accident site. Fuselage, wing and tail surfaces all showed evidence of both tree and the ground impact. The airplane was destroyed by impact forces and post impact fire.

The wreckage was strewn in a debris field that started at the airport perimeter fence and continued for approximately 1450 feet to where the fuselage came to rest. The airplane over ran the departure end of the runway by about 300 feet as evidenced by the main and nose gears ground scars. Additional ground scars from the left main and nose gears were observed in a horse paddock about 300 feet from the airport perimeter fence, each measuring about 45 and 18 feet respectively. The airplane impacted thirteen trees beginning about 500 feet from the airport perimeter fence. The airplane again impacted the ground, as witnessed by the ground scars, about 400 feet from the initial tree impact and came to rest about 1800 feet west of the departure end of runway 26.

4.0 Fire Damage (reference Attachment 2 for photo documentation)

Examination of the wreckage indicated evidence of a post-crash fire and no evidence of an in-flight fire prior to impact with the trees.

5.0 Structure (reference Attachment 2 for photo documentation)

5.1. Fuselage

The passenger cabin between fuselage station's (FS) 310 and 625 was damaged by impact forces and consumed by post-crash fire down to water line (WL) 73. WL 73 is the lowest measurable point on the fuselage.

The fuselage structure forward and below the windshield from FS 169 to FS 280 was destroyed by impact forces. Both primary and secondary cathode ray tubes (CRT's), EICAS screens, FMS, and the associated mounting aircraft structure down to the keel beam were separated from their mating structure. The radome was located near the initial tree impact point about 750 feet west of the airport perimeter fence.

The engines and nacelles remained attached to their respective pylons and the aft pressure bulkhead exhibited evidence of both impact damage and post crash fire.

5.2. Doors

The main cabin door and service door were closed and latched. The main cabin door was however slightly ajar at the upper edge. The over wing exit doors were found intact in the fuselage. The cargo door and electronic compartment doors were found with the fuselage and exhibited evidence of fire damage. The cargo door was intact with the handle in the stowed and latched position. The cockpit escape hatch was intact but separated from the fuselage and located about 20 feet to the northeast of the fuselage.

5.3. Wings

The wing center section including the right wing to about wing station (WS) 149 was separated from the airplane and was located 25 feet to the north of the fuselage. The right wing from about WS 149 to about WS 294 was located 15 feet west of the wing center section. The remainder of the wing including the winglet was found about 220 feet east of the fuselage and just south of the wreckage path. There were 3 significant impact points on the leading edge at about WS 300, 325 and 361.

The left wing outboard of the wing center section was fragmented into numerous pieces and located throughout the debris field. The inboard section of the left wing leading edge and top skin from about WS 47 to about WS 96 was located adjacent to the left side of the fuselage and exhibited evidence of both impact and fire damage. The lower wing skin from about WS 104 to a WS 282, including a portion of the inboard section of the outboard flap was located just north of the empennage. A three foot section of the left wing leading edge from about WS 107 to WS 143 was located in the debris field about 600 feet east of the fuselage. The left wing tip was sheared off and located near the initial tree impact point about 500 feet west of the airport perimeter fence.

5.4. Empennage

The empennage was located about 100 feet west of the fuselage on its aft side with the left side wrapped around a tree between vertical stabilizer ribs 3 and 4. The right horizontal stabilizer exhibited evidence of impact damage at about horizontal stabilizer station (HS) 102 with a 2 foot tear in the aft direction through both upper and lower skins at about HS 93. The left horizontal stabilizer exhibited evidence of impact damage and was bent upward from about HS 72 on the rear spar to about HS 112 on the front spar. Left the HS tip also exhibited evidence of impact damage. The tailcone separated from the empennage and was located about 120 feet east and slightly south of empennage along the wreckage path.

5.5. Control Surfaces

All of the movable control surfaces remained attached to their primary structure and were identified at the accident site. The left aileron and all of the flaps were fractured in multiple locations.

5.6. Landing Gear

Both the main and nose landing gear were identified at the accident site. Both main gears had separated at their respective airframe attach points while a portion of the nose landing gear remained attached to the airframe.

Brian K. Murphy
Aerospace Engineer, Structures