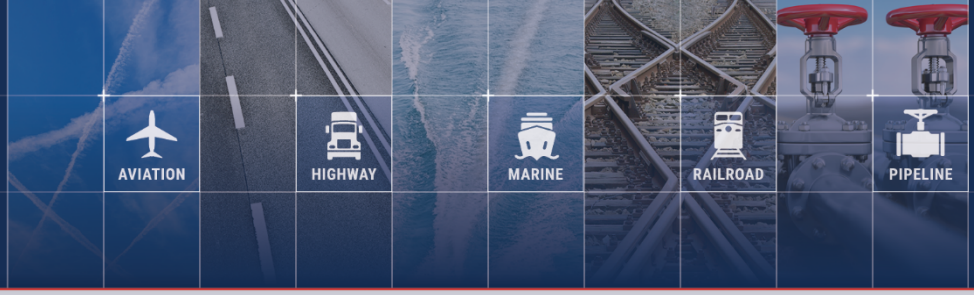

Aviation Investigation Final Report

Location:	Nashville, Tennessee	**Accident Number:**	ANC07LA009
Date & Time:	December 26, 2006, 08:15 Local	**Registration:**	N136WE
Aircraft:	Gates Learjet 35A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	7 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

The airline transport pilot was on an instrument flight rules (IFR) cross-country passenger flight under Title 14, CFR Part 135, when the accident occurred. According to the first officer, while on final approach, the "AUG/AIL" (aileron augmentation) light illuminated, indicating a system malfunction. He reset the system per the flight manual (FM), and the light went out. The approach was continued, but during landing, he reported that the AUG/AIL lamp illuminated again, and that the right wing dropped, striking the ground. The first officer said the captain, who was on the controls, had full left aileron deflection trying to compensate, without success. The airplane landed on runway 2C (center) with a magnetic runway heading of 020 degrees. The airport weather observation reported the wind as 310 degrees at 12 knots, with gusts to 17 knots. The first officer reported the wind as 310 degrees at 12 knots, with gusts to 19 knots. According to the FM, Wind Components Chart, an angle of 70 degrees between the prevailing wind direction and the runway heading, would produce crosswind components of 11 knots steady, and 16 knots during gusts for the reported airport observation. The corresponding wind components for the wind as reported by the first officer, would be 11 knots steady, with 18 knots during gusts. According to the FM, the maximum demonstrated crosswind component, when the wind is 90 degrees to the runway heading, is 24.7 knots. The FAA approved Master Minimum Equipment List limits the airplane to 20 knots maximum crosswind component with the AUG/AIL system inoperative. The AUG/AUL system is computer controlled, and automatically activates when the wing flaps are set below 25 degrees, using a combination of aileron and corresponding spoilers to enhance the airplane's roll rate at low airspeeds. The airplane received structural damage to the right wing. An examination of the aileron augmentation system revealed an anomaly in the computer that controls the AUG/AIL system. When the computer was replaced, the system functioned normally.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate compensation for gusty crosswind conditions during landing, which resulted in a loss of control and collision with the runway. Factors contributing to the accident were the failure of the aileron augmentation (spoiler) flight control system, diminished directional (roll) control, and crosswind gusts.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings
1. (F) FLT CONTROL SYST,WING SPOILER SYSTEM - FAILURE

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
2. (F) DIRECTIONAL CONTROL - DIMINISHED
3. (C) COMPENSATION FOR WIND CONDITIONS - INADEQUATE - PILOT IN COMMAND
4. (F) WEATHER CONDITION - CROSSWIND
5. (F) WEATHER CONDITION - GUSTS

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
6. TERRAIN CONDITION - RUNWAY

Factual Information

On December 26, 2006, about 0815 central standard time, a Gates Learjet 35A airplane, N136WE, sustained substantial damage when its right wing collided with terrain during landing at the Nashville International Airport, Nashville, Tennessee. The airplane was being operated by Secure Air Charter, Nashville, as an instrument flight rules (IFR) on-demand passenger flight under Title 14, CFR Part 135, when the accident occurred. The airline transport certificated pilot, first officer, and five passengers, were not injured. Visual meteorological conditions prevailed, and an IFR flight plan was filed. The flight departed the Raleigh-Durham International Airport, Raleigh, North Carolina, about 0853 eastern standard time.

In a written statement provided to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) dated December 12, the first officer wrote that while inbound on the final approach course to the runway, the "AUG/AIL" (aileron augmentation) light illuminated indicating a system malfunction. He reported that the "spoileron" system was reset per the approved flight manual, and the light went out. According to the first officer, the light stayed off, and the approach was continued. He reported that during the landing, while in ground effect, the AUG/AIL lamp illuminated again, and the right wing dropped, striking the ground. He wrote that the captain, who was on the controls, "put in full left deflection trying to compensate, without success." The landing continued without further incident, and the airplane taxied to the ramp.

The airplane landed on runway 2C (center) with a magnetic runway heading of 020 degrees. The official weather observation for the Nashville International Airport at 0753 reported winds 310 degrees, 12 knots, with gusts to 17 knots. The first officer reported the winds at the time of the accident, 310 degrees at 12 knots, with gusts to 19 knots. According to the Lear 35A Flight Manual (FM), Wind Components Chart, an angle of 70 degrees between the prevailing wind direction and the runway heading, would produce respective crosswind components for the observation of 11 knots steady, and 16 knots during gusts. The corresponding components for the winds as reported by the first officer, would be 11 knots steady, with 18 knots during gusts. The FM indicates a maximum demonstrated crosswind component, when the wind is 90 degrees to the runway heading, of 24.7 knots. The FAA approved Master Minimum Equipment List (MMEL) Revision 6, dated November 30, 2006, limits the airplane to 20 knots maximum crosswind component with the AUG/AIL system inoperative. The FM does not address the continued operation and landing of the airplane if the AUG/AIL reset procedure fails.

The augmented aileron (spoileron) system was incorporated into the airplane design to improve handling qualities (roll axis) at lower airspeeds. When the flaps are retracted above 25 degrees the augmentation system is disabled, and only the speed brake function is operational. When the flaps are extended below the 25 degrees position, the augmentation

system is active, and as the airplane is banked, the corresponding spoiler board is lifted to aid the lifted aileron. The automatic function of the system and spoiler deflection ratio is computer controlled, and includes limits of deflection based on aileron travel. The system will shutdown automatically if an anomaly is detected, leaving the aileron without augmentation, and a reduced roll rate. An enunciator panel warning light visually indicates a system anomaly.

The airplane received structural damage to the right wing outboard of the aileron, damaging a wing spar. An examination of the aileron augmentation system revealed an anomaly in the computer that controls the AUG/AIL system. The computer was replaced, and the system functioned normally.

Pilot Information

Certificate:	Airline transport	**Age:**	59,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	October 1, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 1, 2006
Flight Time:	18500 hours (Total, all aircraft), 2100 hours (Total, this make and model), 17000 hours (Pilot In Command, all aircraft), 150 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport	**Age:**	39,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	August 1, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	January 1, 2006
Flight Time:	3200 hours (Total, all aircraft), 500 hours (Total, this make and model), 2600 hours (Pilot In Command, all aircraft), 150 hours (Last 90 days, all aircraft), 68 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Gates Learjet	**Registration:**	N136WE
Model/Series:	35A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	201
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	October 1, 2006 AAIP	**Certified Max Gross Wt.:**	18000 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:	9680 Hrs at time of accident	**Engine Manufacturer:**	Garrett
ELT:	Installed, not activated	**Engine Model/Series:**	731-2-2B
Registered Owner:	Secure Air Charter LLC	**Rated Power:**	3500 Lbs thrust
Operator:		**Operating Certificate(s) Held:**	Commuter air carrier (135), On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	VQ8A

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KBNA,599 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	07:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	7 miles
Lowest Ceiling:	Overcast / 1500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / 17 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	3°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Raleigh-Durham, NC (RDU)	**Type of Flight Plan Filed:**	IFR
Destination:	Nashville, TN (KBNA)	**Type of Clearance:**	IFR
Departure Time:	08:53 Local	**Type of Airspace:**	

Airport Information

Airport:	Nashville International Airpor BNA	**Runway Surface Type:**	Concrete
Airport Elevation:	599 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	2C	**IFR Approach:**	ILS
Runway Length/Width:	8000 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	5 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	7 None	**Latitude, Longitude:**	36.121387,-86.673614

Administrative Information

Investigator In Charge (IIC):	Lewis, Lawrence
Additional Participating Persons:	Craig Curtis; FAA Nashville FSDO; Nashville, TN
Original Publish Date:	January 31, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65079