		NTSB ID: DCA06RA076A		Aircraft Registration Number: PR-GTD	
		Occurrence Date: 09/29/2006		Most Critical Injury: Fatal	
		Occurrence Type: Accident		Investigated By:	
Location/Time					
Nearest City/Place Azevedo		State	Zip Code	Local Time 1500	Time Zone UTC
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility: 100		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 737-800		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>On September 29, 2006, at approximately 4:57 pm, Brasilia standard time, a midair collision occurred over the Brazilian Amazon jungle, between a Boeing 737-800 (PR-GTD) operated by Gol Airlines of Brazil, and an Embraer Legacy 600 business jet (N600XL) owned and operated by Excelsaire of Long Island, New York.</p> <p>The accident investigation is being conducted under the authority of the Brazilian Aeronautical Accident Prevention and Investigation Center (DIPAA). Under the provisions of ICAO Annex 13, the United States, as state of registry and operator of the Excelsaire Legacy, and state of manufacture of the Boeing 737 and Honeywell avionics equipment in both airplanes, has provided an accredited representative and technical advisors for the investigation. The U.S. team included the accredited representative from the major aviation accident investigations division of the NTSB, as well as technical advisors in operations, systems, air traffic control, flight recorders, and aircraft performance. Additional technical advisors from Boeing, Excelsaire, Honeywell, and FAA have also been included.</p> <p>The Boeing 737 was destroyed by in-flight breakup and impact forces; all 154 occupants were fatally injured. The wreckage of the 737 was located in remote jungle terrain with very difficult access. Brazilian military search and rescue personnel located the flight recorders and all significant portions of the wreckage except the outer portion of the left wing. The Legacy N600XL experienced damage to its left wing and left horizontal stabilizer and performed an emergency landing at the Cachimbo Air Base, approximately 100 miles northwest of the collision site. There was no further damage to the airplane, and the 2 crew members and 5 passengers were not injured. The airplane remained at the base and significant components have been tested and recovered from the aircraft.</p> <p>Visual meteorological conditions prevailed in the area of the accident. Both aircraft were operating under instrument flight rules, on instrument flight plans and clearances. The Boeing 737 was a scheduled domestic air carrier flight enroute from the Eduardo Gomes International Airport, Manaus, Brazil; to the Presidente Juscelino Kubitschek Airport, Brasilia. The Legacy N600XL was enroute from the Prof. Urbano Ernesto Stumpf airport, San Jose dos Campos, Brazil (SBSJ), to a stopover in Manaus, and eventually enroute back to the U.S. This was Excelsaire's initial flight with this aircraft, taking delivery from the Embraer factory and a planned flight to Excelsaire's home base in New York.</p> <p>The Legacy N600XL departed SBSJ at about 2:51 pm. The filed flight plan included a routing via the OREN departure procedure to Pocos beacon, then airway UW2 to Brasilia VOR (BRS), airway UZ6 to Manaus. The cruise altitude was filed as FL370, with a planned change to FL360 at BRS, and to FL380 at the TERES navigational fix, approximately 282 miles north of BRS.</p> <p>After takeoff, N600XL was issued a number of interim altitudes during climb, all of which were read back. The flight was cleared to proceed direct to Araxa VOR (on airway UW2), and at 3:11 pm was</p>					
FACTUAL REPORT - AVIATION					
Page 1					

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: DCA06RA076A

Occurrence Date: 09/29/2006

Occurrence Type: Accident

Narrative (Continued)

cleared to climb to FL370. At 3:33 pm, the airplane leveled at FL370.

At 3:35 pm, the Boeing 737 departed Eduardo Gomes airport, requesting FL370 as a cruise altitude, and a routing via UZ6 to BRS. The airplane reached FL370 at 3:58 pm. There were no anomalies in communications with or radar surveillance of the Boeing 737 throughout the flight.

At 3:51 pm, an air traffic controller in the Brasilia ACC (CINDACTA 1) instructed N600XL to change frequencies to the next controller's sector. The crew of N600XL reported in on the assigned frequency that the flight was level at FL370. ATC acknowledged and instructed the crew to "ident" (flash their transponder). Radar indicates that the ident was observed. This was the last two-way communication between N600XL and ATC. At this time the airplane was approximately 40 nautical miles south of BRS.

At 3:56pm the Legacy N600XL passed BRS level at FL370. There is no record of a request from N600XL to the control agencies to conduct a change of altitude, after reaching flight level 370. The crew made calls, but there is no communication in which they requested a change of flight level. There is also no record of any instruction from air traffic controllers at Brasilia Center to the aircraft, directing a change of altitude.

When the airplane was about 30 miles north-northwest of BRS, at 4:02 pm, the transponder of N600XL was no longer being received by ATC radar. A transponder reports a unique code, aiding radar identification, and provides an accurate indication of the airplane's altitude. Additionally, the transponder is a required component for the operation of Traffic Collision Avoidance System equipment, commonly called the TCAS system.

Between 3:51 pm and 4:26 pm, there were no attempts to establish radio communications from either the crew of N600XL or ATC. At 4:26 pm the CINDACTA 1 controller made a "blind call" to N600XL. Subsequently until 4:53 pm, the controller made an additional 6 radio calls attempting to establish contact. The 4:53 call instructed the crew to change to frequencies 123.32 or 126.45. No replies were received.

There is no indication that the crew of N600XL performed any abnormal maneuvers during the flight. Flight Data Recorder information indicates that the airplane was level at FL370, on course along UZ6, and at a steady speed, until the collision. Primary (non-transponder) radar returns were received corresponding to the estimated position of N600XL until about 4:30 pm. For 2 minutes, no returns were received, then returns reappeared until 4:38 pm. After that time, radar returns were sporadic.

Beginning at 4:48 pm, the crew of N600XL made a series of 12 radio calls to ATC attempting to make contact. At 4:53, the crew heard the call instructing them to change frequencies, but the pilot did not understand all of the digits, and requested a repeat. No reply from ATC was received. The pilot made 7 more attempts to establish contact. At 4:56:54 pm the collision occurred at FL370, at a point about 460 nautical miles north-northwest of BRS, on airway UZ6.

There was no indication of any TCAS alert on board either airplane, no evidence of pre-collision visual acquisition by any flight crew member on either aircraft, and no evidence of evasive action by either crew.

Wreckage and damage examination indicates that it is likely the left winglet of the Legacy (which includes a metal spar) contacted the left wing leading edge of the Boeing 737. The impact resulted in damage to a major portion of the left wing structure and lower skin, causing the outer portion of the wing to fail in an upward direction, separating the outer portion of the wing and a significant portion of additional upper wing skin, ultimately rendering the 737 uncontrollable. Flight recorder information ceased at an approximate altitude of 7,887 feet.

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: DCA06RA076A

Occurrence Date: 09/29/2006

Occurrence Type: Accident

Narrative (Continued)

After the collision, the crew of N600XL made numerous further calls to ATC declaring an emergency and their intent to make a landing at the Cachimbo air base. At 5:02 pm, the transponder returns from N600XL were received by ATC.


At 5:13 pm, an uninvolved flight crew assisted in relaying communications between N600XL and ATC until the airplane established communication with Cachimbo tower.


Flight recorders from both airplanes were recovered and downloaded at the Transportation Safety Board of Canada (TSB) laboratories. Transcriptions of the cockpit voice recorders (CVRs) were prepared (the transcript of the Legacy's CVR was produced at the NTSB's laboratory in Washington, D.C.) and data from flight data recorders obtained.

Initial interviews and medical examinations were conducted with the crew of the Legacy. Air Traffic Control data was gathered. Preliminary tests of the avionics equipment on the Legacy were performed. Wreckage of the 737 was examined.

Additional investigative work will include laboratory tests of the avionics components removed from the Legacy, an examination of the operating procedures of the avionics, interviews with ATC personnel, examination of ATC practices and comparison between Brazilian and FAA procedures, a technical examination of ATC communication and surveillance systems, and further examination of the training provided to the operators.

Brazilian Contact: Brazilian Aeronautical Accident Prevention & Investigation Center 55-61-3329-9160

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: DCA06RA076A				
		Occurrence Date: 09/29/2006				
		Occurrence Type: Accident				
Landing Facility/Approach Information						
Airport Name Cachimbo airbase		Airport ID:	Airport Elevation Ft. MSL	Runway Used NA	Runway Length	Runway Width
Runway Surface Type:						
Runway Surface Condition:						
Type Instrument Approach: Unknown						
VFR Approach/Landing: Unknown						
Aircraft Information						
Aircraft Manufacturer Boeing		Model/Series 737-800		Serial Number		
Airworthiness Certificate(s): Transport						
Landing Gear Type: Tricycle						
Homebuilt Aircraft? No	Number of Seats:	Certified Max Gross Wt. LBS		Number of Engines: 2		
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:			
- Aircraft Inspection Information						
Type of Last Inspection		Date of Last Inspection	Time Since Last Inspection Hours	Airframe Total Time 235 Hours		
- Emergency Locator Transmitter (ELT) Information						
ELT Installed?	ELT Operated?	ELT Aided in Locating Accident Site?				
Owner/Operator Information						
Registered Aircraft Owner Gol Air		Street Address				
		City Sao Paulo	State	Zip Code		
Operator of Aircraft Same as Reg'd Aircraft Owner		Street Address Same as Reg'd Aircraft Owner				
		City	State	Zip Code		
Operator Does Business As:			Operator Designator Code:			
- Type of U.S. Certificate(s) Held: None						
Air Carrier Operating Certificate(s):						
Operating Certificate:			Operator Certificate:			
Regulation Flight Conducted Under: Non-U.S., Commercial						
Type of Flight Operation Conducted: Scheduled; Domestic; Passenger Only						
FACTUAL REPORT - AVIATION						

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: DCA06RA076A	
	Occurrence Date: 09/29/2006	
	Occurrence Type: Accident	

First Pilot Information

Name On File	City	State	Date of Birth	Age
-----------------	------	-------	---------------	-----

Sex:	Seat Occupied:	Principal Profession:	Certificate Number:
------	----------------	-----------------------	---------------------

Certificate(s):

Airplane Rating(s):

Rotorcraft/Glider/LTA:

Instrument Rating(s):

Instructor Rating(s):

Type Rating/Endorsement for Accident/Incident Aircraft?	Current Biennial Flight Review?
---	---------------------------------

Medical Cert.:	Medical Cert. Status:	Date of Last Medical Exam:
----------------	-----------------------	----------------------------

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time										
Pilot In Command(PIC)										
Instructor										
Last 90 Days										
Last 30 Days										
Last 24 Hours										

Seatbelt Used?	Shoulder Harness Used?	Toxicology Performed?	Second Pilot? Yes
----------------	------------------------	-----------------------	-------------------

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point Manaus	State	Airport Identifier	Departure Time	Time Zone
Destination Brasilia	State	Airport Identifier		


Type of Clearance: IFR

Type of Airspace: Class A

Weather Information

Source of Briefing:

Method of Briefing:

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: DCA06RA076A
	Occurrence Date: 09/29/2006
	Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation <small>Ft. MSL</small>	WOF Distance From Accident Site <small>NM</small>	Direction From Accident Site <small>Deg. Mag.</small>
Sky/Lowest Cloud Condition:				<small>Ft. AGL</small>	Condition of Light:
Lowest Ceiling:			<small>Ft. AGL</small>	Visibility: <small>SM</small>	Altimeter: <small>"Hg</small>
Temperature: <small>°C</small>	Dew Point: <small>°C</small>	Wind Direction:		Density Altitude: <small>Ft.</small>	
Wind Speed:	Gusts:	Weather Conditions at Accident Site: Instrument Conditions			
Visibility (RVR): <small>Ft.</small>	Visibility (RVV) <small>SM</small>	Intensity of Precipitation:			
Restrictions to Visibility:					
Type of Precipitation:					

Accident Information

Aircraft Damage: Destroyed	Aircraft Fire:	Aircraft Explosion
----------------------------	----------------	--------------------

Classification:

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot	1				1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants	4				4
Other Crew					
Passengers	148				148
- TOTAL ABOARD -	154				154
Other Ground					
- GRAND TOTAL -	154				154

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: DCA06RA076A

Occurrence Date: 09/29/2006

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

William English

Additional Persons Participating in This Accident/Incident Investigation:

Tony James