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## Turbulence injury, Boeing 757-2G7, May 28, 2001

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**Micro-summary:** This Boeing 737-301 had an encounter with turbulence during an enroute climb, resulting in a serious injury to one flight attendant.

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**Event Date:** 2001-05-28 at 0940 EDT


**Investigative Body:** National Transportation Safety Board (NTSB), USA

**Investigative Body's Web Site:** <http://www.nts.gov/>

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1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).
  2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. ***Your company's flight operations manual is the final authority as to the safe operation of your aircraft!***
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		NTSB ID: MIA01LA146		Aircraft Registration Number: N349US	
		Occurrence Date: 05/28/2001		Most Critical Injury: Serious	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Toccoa	State GA	Zip Code 30577	Local Time 0940	Time Zone EDT	
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 737-301		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 May 28, 2001, at about 0940 eastern daylight time, a Boeing 737-301, N349US, flight 351, registered to First Union National Bank Trustee and operated by US Airways Inc, as a 14 CFR Part 121 scheduled domestic passenger flight, from Atlanta, Georgia, to Pittsburgh, Pennsylvania, experienced an in-flight encounter with weather (turbulence) while climbing between flight level (FL) 220 to 240 in the vicinity of Toccoa, Georgia. Visual meteorological conditions prevailed and an IFR flight plan was filed. The airplane was not damaged. The airline transport rated pilot-in-command (PIC), first officer, 2 flight attendants and 116 passengers reported no injuries. One flight attendant sustained serious injuries. The flight originated from Atlanta about 17 minutes before the accident. The PIC diverted to Atlanta and landed with out further incident at 0955.</p> <p>The PIC stated they were in a climb following another airplane which reported no problems ahead, the seat belt sign was illuminated, and he had briefed the crew on the weather conditions before departing Atlanta. They had just come out of some rain showers and were in the clear between FL 220 to 240. All weather activity was located off the left wing to the north. The other jet located to their front had just requested a vector when they experienced some light to moderate turbulence. The fasten seat belt sign was on and the crew had been briefed on the weather conditions prior to the flight. A short time later, he was informed that a flight attendant had broken her ankle. He requested and received clearance to return to Atlanta.</p> <p>The injured flight attendant stated that before the flight the captain held a routine preflight briefing, and there was no specific warning of bad weather that she could recall. During the takeoff she occupied the forward jump seat with the "A" flight attendant. After the "two bell signal" she released her seat belt and started back to the aft galley to assist the "B" flight attendant. They removed the service cart and were preparing to serve when they felt a few bumps. They decided that they would wait awhile to begin the service due to the turbulence when aircraft suddenly plunged. She was standing by the 2L door and was thrown into the air. When she landed she felt pain in her right foot. A quick examination revealed that bones were protruding and that her leg was bleeding. The "B" flight attendant tried to assist her, and she informed her to advise the captain of the situation.</p> <p>Review of the NTSB Meteorology Factual Report revealed there were no severe weather forecast Alerts, Segments, Center Weather Advisories, or Airmets for turbulence over Georgia at the time of the accident and none was required. (For additional information see NTSB Meteorology Factual Report, an attachment to this report.)</p> <p>The Loral-Fairchild model F1000 solid state flight data recorder (FDR) was removed from N349US after the accident flight and shipped to the NTSB Vehicle Recorder Division's laboratory in Washington D.C. for readout and evaluation. The FDR data for the accident flight indicated that while the airplane was ascending from 21,500 to 22,500 feet pressure altitude, the airplane</p>					
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National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**

SAFETY BOARD

NTSB ID: MIA01LA146


Occurrence Date: 05/28/2001


Occurrence Type: Accident

Narrative (Continued)

experienced dynamic accelerations for about 20 seconds. The maximum normal acceleration recorded during the event was 1.738 G's at FDR elapsed time 31,450 seconds. The minimum normal acceleration recorded during the event was 0.776 G's at FDR elapsed time 31,451 seconds. (For additional information see NTSB Flight Data Recorder Factual Report, an attachment to this report.)

The FDR was released to US Airways on July 3, 2001.

 <b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b>		NTSB ID: MIA01LA146				
		Occurrence Date: 05/28/2001				
		Occurrence Type: Accident				
<b>Landing Facility/Approach Information</b>						
Airport Name		Airport ID:	Airport Elevation Ft. MSL	Runway Used	Runway Length	Runway Width
Runway Surface Type: Unknown						
Runway Surface Condition: Unknown						
Type Instrument Approach: NONE						
VFR Approach/Landing: None						
<b>Aircraft Information</b>						
Aircraft Manufacturer Boeing		Model/Series 737-301		Serial Number 23552		
Airworthiness Certificate(s): Transport						
Landing Gear Type: Retractable - Tricycle						
Homebuilt Aircraft? No		Number of Seats: 121		Certified Max Gross Wt. LBS		Number of Engines: 2
Engine Type: Turbo Jet		Engine Manufacturer: CFM International		Model/Series: CFM56-3B2		Rated Power: 20000 LBS
- Aircraft Inspection Information						
Type of Last Inspection Unknown		Date of Last Inspection		Time Since Last Inspection Hours		Airframe Total Time Hours
- Emergency Locator Transmitter (ELT) Information						
ELT Installed? Yes		ELT Operated? No		ELT Aided in Locating Accident Site? No		
<b>Owner/Operator Information</b>						
Registered Aircraft Owner First Union National Bank Trustee		Street Address One Rodney Square				
		City Wilmington		State DE	Zip Code 19801	
Operator of Aircraft US Airways Inc		Street Address 2345 Crystal Drive				
		City Arlington		State VA	Zip Code 22227	
Operator Does Business As:				Operator Designator Code: USAA		
- Type of U.S. Certificate(s) Held:						
Air Carrier Operating Certificate(s): Flag Carrier/Domestic						
Operating Certificate:			Operator Certificate:			
Regulation Flight Conducted Under: Part 121: Air Carrier						
Type of Flight Operation Conducted: Scheduled; Domestic; Passenger Only						

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: MIA01LA146
	Occurrence Date: 05/28/2001
	Occurrence Type: Accident

**First Pilot Information**

Name On File	City On File	State On File	Date of Birth	Age
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Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
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Certificate(s):

Airplane Rating(s): Multi-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Type Rating/Endorsement for Accident/Incident Aircraft? Yes	Current Biennial Flight Review?
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Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--w/ waivers/lim.	Date of Last Medical Exam: 12/2000
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- 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	17225	8323								
Pilot In Command(PIC)										
Instructor										
Last 90 Days	174									
Last 30 Days										
Last 24 Hours										

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? No	Second Pilot? Yes
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**Flight Plan/Itinerary**

Type of Flight Plan Filed: IFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Atlanta	GA	ATL	0923	EDT
Destination	State	Airport Identifier		
Pittsburg	PA	PIT		


Type of Clearance: IFR

Type of Airspace: Class A

**Weather Information**

Source of Briefing: Company

Method of Briefing: Telephone

 <p>National Transportation Safety Board <b>FACTUAL REPORT</b> AVIATION</p>	NTSB ID: MIA01LA146
	Occurrence Date: 05/28/2001
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**Weather Information**

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
GVL	0941	EDT	1275 Ft. MSL	15 NM	180 Deg. Mag.
Sky/Lowest Cloud Condition:				Ft. AGL	Condition of Light: Day
Lowest Ceiling: Broken			2400 Ft. AGL	Visibility: 4 SM	Altimeter: 30.03 "Hg
Temperature: 18 °C	Dew Point: 17 °C	Wind Direction: 260		Density Altitude: Ft.	
Wind Speed: 11	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): Ft.	Visibility (RVV)	SM	Intensity of Precipitation:		
Restrictions to Visibility: None					
Type of Precipitation: None					

**Accident Information**

Aircraft Damage: None	Aircraft Fire: None	Aircraft Explosion: None
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Classification: U.S. Registered/U.S. Soil

- 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		1		2	3
Other Crew					
Passengers				116	116
- TOTAL ABOARD -		1		120	121
Other Ground					
- GRAND TOTAL -		1		120	121

National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**



NTSB ID: MIA01LA146

Occurrence Date: 05/28/2001

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

Carrol A. Smith

Additional Persons Participating in This Accident/Incident Investigation:

William J Simpson  
Aviation Safety Inspector  
Atlanta FSDO  
1701 Columbia Avenue Suite 2-110  
College Park, GA 30337