

---

## Turbulence injuries, Boeing 737-201, June 22, 1996

---

**Micro-summary:** This Boeing 737-201 experienced severe turbulence on descent, injuring two people.

---

**Event Date:** 1996-06-22 at 1545 MDT


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


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


---

### **Cautions:**

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!***
  3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.
  4. Contact us before reproducing or redistributing a report from this anthology. Individual countries have very differing views on copyright! We can advise you on the steps to follow.
-

		NTSB ID: FTW96LA271		Aircraft Registration Number: N207AU	
		Occurrence Date: 06/22/1996		Most Critical Injury: Serious	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place GRANITE		State CO	Zip Code 81228	Local Time 1545	Time Zone MDT
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 737-201		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 June 22, 1996, approximately 1545 mountain daylight time, a Boeing 737-201, N207AU, operated by Frontier Airlines, Inc., as flight 328, in scheduled domestic passenger service, was not damaged when it encountered severe turbulence during descent over Granite, Colorado. One passenger received serious injuries, and one passenger and two flight attendants received minor injuries. There were no injuries to the airline transport-rated captain and first officer, and the other flight attendant and 91 passengers. Visual meteorological conditions prevailed, and an IFR flight plan had been filed. The flight was being conducted under Title 14 CFR 121, and originated in Albuquerque, New Mexico, on June 22, 1996, at 1505.</p> <p>According to the captain, he had begun the descent from FL290 into Denver and had been forewarned of reported turbulence. The "Fasten Seat Belts" sign was turned on, and flight attendants were instructed to be seated and to fasten their seat belts. An elderly woman got up and walked towards the aft lavatory. The airplane began to encounter light turbulence and a flight attendant attempted to seat the passenger in a flight attendant jump seat. Before her seat belt could be fastened, the airplane encountered severe turbulence and the passenger sustained a serious back injury. The flight attendant struck her head against the cabin ceiling, then struck her hip against the galley. At that time, the airplane was at FL240. Written statements were submitted by the three cabin crew members that corroborated the captain's report.</p> <p>The digital flight data recorder (DFDR) was removed from the airplane and sent to NTSB headquarters in Washington, D.C. for examination. According to the Flight Data Recorder Specialist's Report, the airplane was on a magnetic heading of 325 degrees, at 280 knots, and in a shallow descent from 29,000 feet when the DFDR recorded "violent vertical acceleration oscillations" that lasted approximately 150 seconds. Oscillation magnitudes ranged from +2.0 g's to -0.5 g's.</p>					
FACTUAL REPORT - AVIATION					
					Page 1

 <b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b>		NTSB ID: FTW96LA271			
		Occurrence Date: 06/22/1996			
		Occurrence Type: Accident			
<b>Landing Facility/Approach Information</b>					
Airport Name	Airport ID:	Airport Elevation Ft. MSL	Runway Used 0	Runway Length	Runway Width
Runway Surface Type:					
Runway Surface Condition:					
Type Instrument Approach:					
VFR Approach/Landing:					
<b>Aircraft Information</b>					
Aircraft Manufacturer Boeing		Model/Series 737-201		Serial Number 19423	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 113	Certified Max Gross Wt. 109000 LBS	Number of Engines: 2		
Engine Type: Turbo Jet	Engine Manufacturer: P&W	Model/Series: JT8D-9A	Rated Power: 14500 LBS		
- Aircraft Inspection Information					
Type of Last Inspection Continuous Airworthiness	Date of Last Inspection 06/1996	Time Since Last Inspection 9 Hours	Airframe Total Time 83 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? No	ELT Operated?	ELT Aided in Locating Accident Site?			
<b>Owner/Operator Information</b>					
Registered Aircraft Owner USAIR, INC.		Street Address 2345 CRYSTAL DR.			
		City ARLINGTON	State VA	Zip Code 22227	
Operator of Aircraft FRONTIER AIRLINES		Street Address 12015 E. 46TH AVE., SUITE 200			
		City DENVER	State CO	Zip Code 80239	
Operator Does Business As:			Operator Designator Code: F3LA		
- 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					
FACTUAL REPORT - AVIATION					

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: FTW96LA271
	Occurrence Date: 06/22/1996
	Occurrence Type: Accident

**First Pilot Information**

Name On File	City On File	State On File	Date of Birth On File	Age 55
-----------------	-----------------	------------------	--------------------------	-----------

Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
--------	---------------------	--------------------------------------	-----------------------------

Certificate(s): Airline Transport; Commercial; Flight Engineer

Airplane Rating(s): Multi-engine Land; Single-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?
---	---------------------------------

Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--no waivers/lim.	Date of Last Medical Exam: 04/1996
------------------------	--	------------------------------------

- 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	21230	893	400	20830		4800	430			
Pilot In Command(PIC)										
Instructor										
Last 90 Days	180									
Last 30 Days	60									
Last 24 Hours	9									

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? No	Second Pilot? Yes
--------------------	----------------------------	--------------------------	-------------------

**Flight Plan/Itinerary**

Type of Flight Plan Filed: IFR

Departure Point ALBUQUERQUE	State NM	Airport Identifier ABQ	Departure Time 1505	Time Zone MDT
--------------------------------	-------------	---------------------------	------------------------	------------------

Destination DENVER	State CO	Airport Identifier DEN	
-----------------------	-------------	---------------------------	--


Type of Clearance: IFR

Type of Airspace: Class A

**Weather Information**

Source of Briefing: Company

Method of Briefing:

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: FTW96LA271
	Occurrence Date: 06/22/1996
	Occurrence Type: Accident

<b>Weather Information</b>					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
DEN	1453	MDT	5431 Ft. MSL	109 NM	46 Deg. Mag.
Sky/Lowest Cloud Condition: Scattered			8000 Ft. AGL	Condition of Light: Day	
Lowest Ceiling: None		0 Ft. AGL		Visibility: 10 SM	Altimeter: 29.00 "Hg
Temperature: 21 °C	Dew Point: 8 °C	Wind Direction: 300		Density Altitude: 7360 Ft.	
Wind Speed: 20	Gusts: 26	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): 0 Ft.	Visibility (RVV) 0 SM	Intensity of Precipitation: Unknown			
Restrictions to Visibility: None					
Type of Precipitation: None					

<b>Accident Information</b>		
Aircraft Damage: None	Aircraft Fire: None	Aircraft Explosion: None

Classification: U.S. Registered/U.S. Soil					
<b>- Injury Summary Matrix</b>	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		1	1	91	93
- TOTAL ABOARD -		1	2	95	98
Other Ground	0	0	0		0
- GRAND TOTAL -	0	1	2	95	98

National Transportation Safety Board

**FACTUAL REPORT**  
**AVIATION**



NTSB ID: FTW96LA271

Occurrence Date: 06/22/1996

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

ARNOLD W. SCOTT

Additional Persons Participating in This Accident/Incident Investigation: