



# National Transportation Safety Board Aviation Incident Final Report

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<b>Location:</b>	HOUSTON, TX	<b>Incident Number:</b>	FTW95IA083
<b>Date &amp; Time:</b>	01/01/1995, 1150 CST	<b>Registration:</b>	N326SW
<b>Aircraft:</b>	BOEING 737-3A4	<b>Aircraft Damage:</b>	None
<b>Defining Event:</b>		<b>Injuries:</b>	66 None

**Flight Conducted Under:** Part 121: Air Carrier - Scheduled

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## Analysis

DURING DESCENT FOR THE LANDING APPROACH THE PILOT EXPERIENCED UNCOMMANDED ROLL DIVERGENCE. THE AIRCRAFT WAS AT APPROXIMATELY 240 KNOTS, CLEAN CONDITION, AND POWER WAS REDUCED AT THE TIME OF THE OCCURRENCE. THE AIRCRAFT WAS FOLLOWING AN MD-80 WHEN THE EVENT OCCURRED. THE FIRST PILOT WAS AT THE CONTROLS WHEN THE UNCOMMANDED ROLLS OCCURRED, HOWEVER, THE CAPTAIN ASSUMED CONTROL EARLY DURING THE SEQUENCE. IT WAS NOTED THAT THE AUTOPILOT ALTITUDE HOLD WAS ENGAGED. THE INITIAL DIVERGENCE WAS A 20 DEGREE RIGHT ROLL. AS THE RIGHT ROLL WAS DEVELOPING THE PILOT APPLIED A LEFT CORRECTION, AND THE AIRCRAFT ROLLED 30 DEGREES LEFT. THE PILOT THEN APPLIED RIGHT RUDDER WHICH RESULTED IN THE WINGS COMING TO THE LEVEL ATTITUDE. AN EXAMINATION OF THE FLIGHT CONTROL SYSTEM FAILED TO REVEAL ANY ANOMALIES.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: ENCOUNTER WITH WAKE TURBULENCE.

## Findings

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Occurrence #1: VORTEX TURBULENCE ENCOUNTERED  
Phase of Operation: APPROACH

### Findings

1. (C) WAKE TURBULENCE - ENCOUNTERED

## Factual Information

On January 1, 1995, at 1150 central standard time, a Boeing 737- 3A4, N326SW, experienced a partial loss of roll control during approach near Houston, Texas. There was no airplane damage and none of the 5 crewmembers or 61 passengers were injured. The airplane was operated by Southwest Airlines as Flight 293, scheduled domestic Part 121 service from Dallas, Texas, to the Houston, Texas, Intercontinental Airport. The airplane was level at 6,000 feet on a standard instrument arrival in visual meteorological conditions decelerating through about 240 knots.

The copilot was flying the airplane when the flight encountered wake turbulence from a MD-80. Flight 293 was in a clean configuration and power reduced in order to decelerate. The autopilot was engaged in altitude hold and control wheel steering. After encountering the disturbed air the airplane began to roll right 20 degrees and the copilot responded with left yoke. The airplane then rolled into a 30 degree left bank and the copilot applied full right aileron, but the roll continued to the left. The captain took control of the airplane and applied right rudder as he maintained the aileron input. Control was regained and the remainder of the flight was normal.

Inspection and evaluation of the flight control systems failed to reveal any anomalies.

## Pilot Information

<b>Certificate:</b>	Airline Transport; Flight Instructor; Commercial	<b>Age:</b>	37, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land; Single-engine Sea	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Glider	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	08/30/1994
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	12000 hours (Total, all aircraft), 8000 hours (Total, this make and model), 7500 hours (Pilot In Command, all aircraft), 200 hours (Last 90 days, all aircraft), 60 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Make:	BOEING	Registration:	N326SW
Model/Series:	737-3A4 737-3A4	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Transport	Serial Number:	
Landing Gear Type:	Retractable - Tricycle	Seats:	145
Date/Type of Last Inspection:	Annual	Certified Max Gross Wt.:	116000 lbs
Time Since Last Inspection:		Engines:	2 Turbo Fan
Airframe Total Time:		Engine Manufacturer:	GE
ELT:	Installed, activated	Engine Model/Series:	CFM56-3
Registered Owner:	SOUTHWEST AIRLINES CO.	Rated Power:	20000 lbs
Operator:	SOUTHWEST AIRLINES CO.	Operating Certificate(s) Held:	Flag carrier (121)
Operator Does Business As:		Operator Designator Code:	SWAA

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	, 0 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	0000	Direction from Accident Site:	0°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	0 Miles
Lowest Ceiling:	Unknown / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	
Precipitation and Obscuration:			
Departure Point:	DALLAS, TX (DAL)	Type of Flight Plan Filed:	IFR
Destination:		Type of Clearance:	IFR
Departure Time:	1100 CST	Type of Airspace:	Class E

## Wreckage and Impact Information

Crew Injuries:	5 None	Aircraft Damage:	None
Passenger Injuries:	61 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	66 None	Latitude, Longitude:	

## Administrative Information

**Investigator In Charge (IIC):** MATTHEW ELLIS, **Report Date:** 08/31/1995

**Additional Participating Persons:** SIDNEY P ALEXANDER; HOUSTON, TX

**Publish Date:**

**Investigation Docket:** NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at [pubinq@ntsb.gov](mailto:pubinq@ntsb.gov), or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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