

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



DCA24FA143

FLIGHT DATA RECORDER

Specialist's Factual Report

April 9, 2026

TABLE OF CONTENTS

A. ACCIDENT	3
B. FLIGHT DATA RECORDER SPECIALIST	3
C. FEDERAL CARRIAGE REQUIREMENTS.....	3
D. DETAILS OF THE INVESTIGATION	3
1.0 Recorder Description	3
1.1 Recording Description	3
1.2 Engineering Unit Conversions	4
1.3 Time Correlation	4
E. FIGURES AND TABULAR DATA.....	4
APPENDIX A. VERIFIED AND PROVIDED PARAMETERS	11

A. ACCIDENT

Location: Gulf of America
Date: April 3, 2024
Time: 0823 Eastern Daylight Time (EDT)
1223 Coordinated Universal time (UTC)
Airplane: Boeing 737-7CT
Southwest Airlines flight 4273
Registration: N567WN

B. FLIGHT DATA RECORDER SPECIALIST

Specialist: Cassandra Johnson
Mechanical Engineer
National Transportation Safety Board (NTSB)

C. FEDERAL CARRIAGE REQUIREMENTS

The event aircraft, N567WN, was operating under Title 14 *Code of Federal Regulations* (CFR) Part 121. The event aircraft was manufactured in October 2002 and was operating such that it was required to be equipped with a flight data recorder (FDR) that recorded, at a minimum, 91 parameters, as cited in 14 CFR Part 121.344(f).

D. DETAILS OF THE INVESTIGATION

An FDR group was not convened. The NTSB Vehicle Recorder Division received an electronic file containing the FDR data from the N567WN aircraft.

1.0 Recorder Description

The FDR data in the electronic file was configured such that 256 12-bit words of digital information were recorded every second. Each grouping of 256 words (each second) is called a subframe. Each subframe has a unique 12-bit synchronization (sync) word identifying it as subframe 1, 2, 3, or 4. The sync word is the first word in each subframe. The data stream is in sync when successive sync words appear at proper 256-word intervals. Each data parameter (for example, pressure altitude, pitch angle, roll angle, and magnetic heading) has a specifically assigned word number within the subframe.

1.1 Recording Description

The FDR recording contained the event flight and its duration was about 1 hour. Timing of the FDR data is measured in subframe reference number (SRN),

where each SRN equals one elapsed second. The parameters evaluated for the purpose of this report appeared to be in accordance with federal FDR carriage requirements.

1.2 Engineering Unit Conversions

The engineering unit conversions used for the data contained in this report are based on documentation from the aircraft manufacturer. Where applicable, the conversions have been changed to ensure that the parameters conform to the NTSB's standard sign convention that climbing right turns are positive (CRT=+).¹

In appendix A, table 1 lists the FDR parameters verified and provided in this report. Additionally in appendix A, table 2 describes the unit abbreviations used in this report.

1.3 Time Correlation

Correlation of the FDR data from SRN to UTC was established by using the recorded Greenwich Mean Time (GMT) Hours, GMT Minutes, and GMT Seconds.² Accordingly, the time offset for the event flight data from SRN to UTC is the following: $UTC = SRN - 42,322$. Therefore, for the rest of this report, all times are referenced as UTC, not SRN.

E. FIGURES AND TABULAR DATA

Figures 1 to 5 contain FDR data recorded during the event on April 3, 2024. All the parameters listed in table 1 are plotted except GMT Hours, GMT Minutes, and GMT Seconds.

Figure 1 is an overlay of the entire flight from Louis Armstrong New Orleans International Airport (KMSY) in Kenner, Louisiana, to Tampa International Airport (KTPA) in Tampa, Florida, using Google Earth. The upset encounter is marked on the flight path. The weather and lighting conditions in Google Earth are not necessarily representative of the weather and lighting conditions present at the time of the recording.

Figures 2 and 3 are time history plots of basic and flight control parameters, respectively, for the entire flight. Figures 4 and 5 are time history plots of basic and flight control parameters, respectively, focusing on the vertical acceleration excursions. These figures are configured such that right turns are indicated by the

¹ CRT=+ means that for any parameter recorded that indicates a climb or a right turn, the sign for that value is positive. Also, for any parameter recorded that indicates an action or deflection, if it induces a climb or right turn, the value is positive. Examples: Right Roll = +, Left Aileron Trailing Edge Down = -, Right Aileron Trailing Edge Up = +, Pitch Up = +, Elevator Trailing Edge Up = +, Right Rudder = +.

² GMT is also known as UTC.

trace moving toward the bottom of the page, left turns towards the top of the page, and nose up attitudes towards the top of the page.

The FDR data indicated about 30 minutes after takeoff while at a pressure altitude of approximately 37,000 feet, the aircraft encountered an upset from about 12:23:24 UTC to about 12:25:03 UTC. During this time, the minimum vertical acceleration deviation from 1 g was -0.45 g at 12:23:34 UTC while the aircraft was located at N28°20'06" and W86°25'58". One second later at 12:23:35 UTC, the maximum vertical acceleration deviation was 1.80 g. About 32 minutes later, the aircraft landed.

The corresponding tabular data used to create figures 1 to 5, including GMT Hours, GMT Minutes, and GMT Seconds, are provided in electronic comma-separated value (CSV) format as attachment 1 to this report.

Submitted by:

Cassandra Johnson
Mechanical Engineer

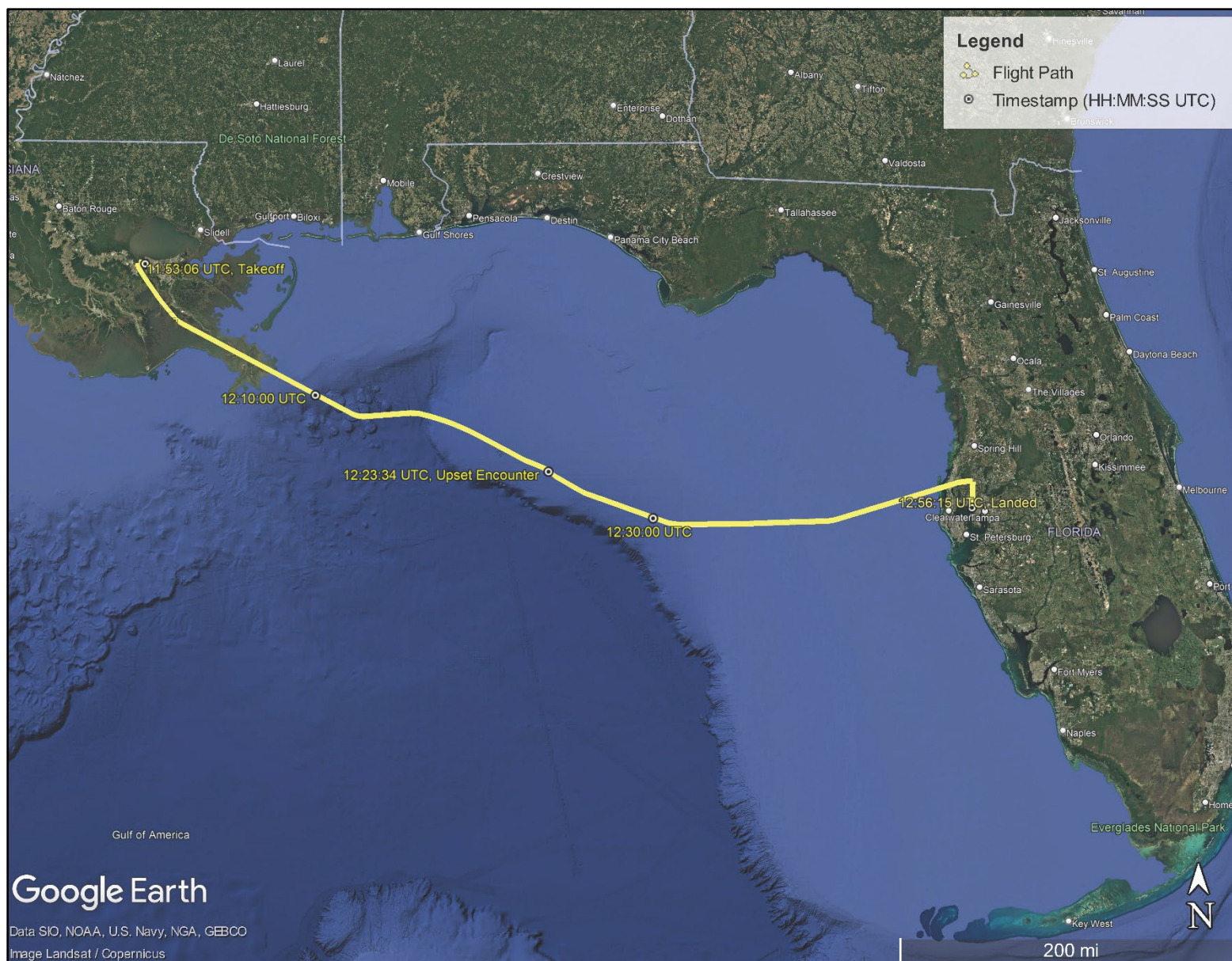


Figure 1. Google Earth overlay of aircraft's entire flight path with the upset encounter marked.

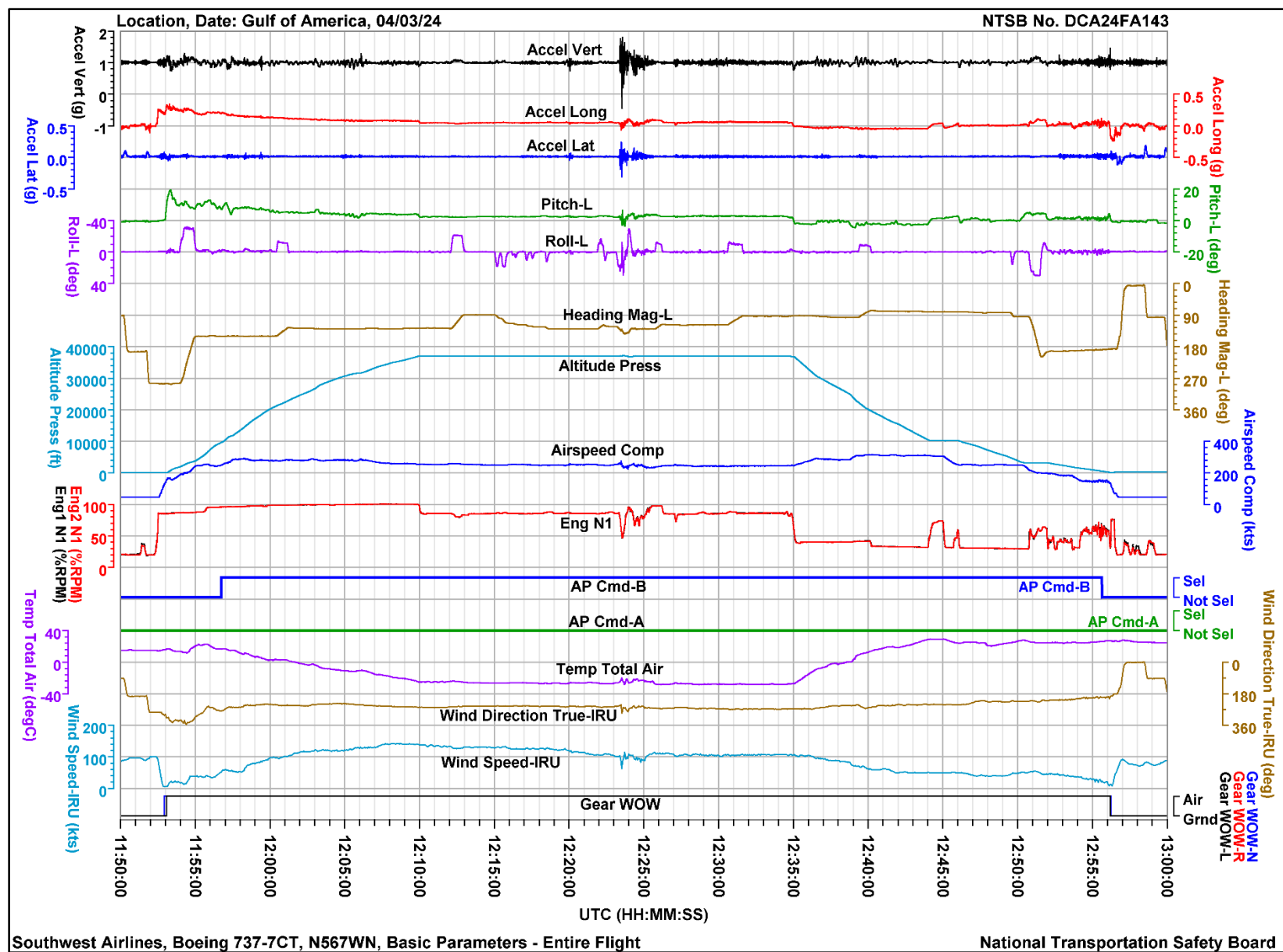


Figure 2. Plot of basic parameters for entire flight.

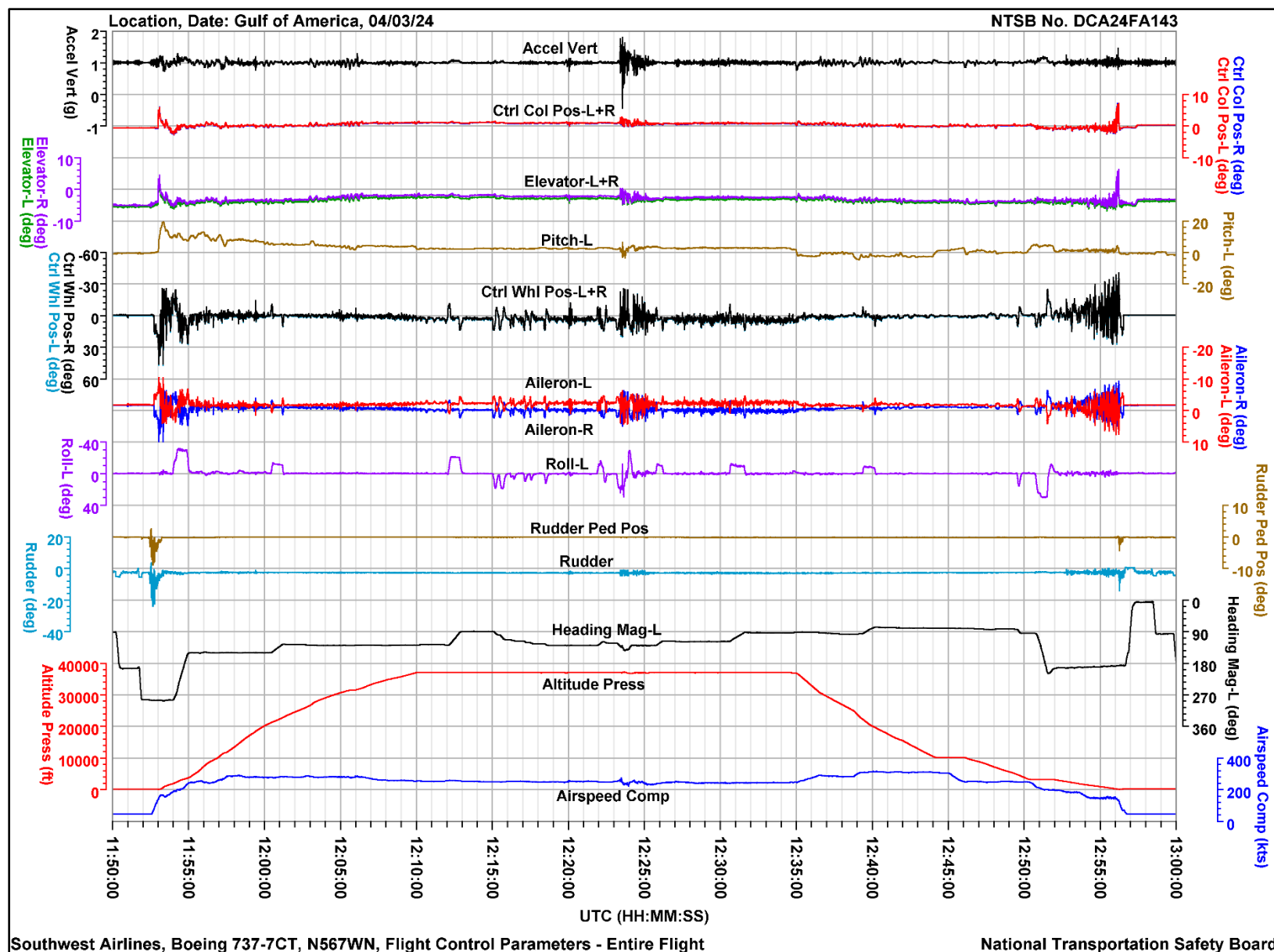


Figure 3. Plot of flight control parameters for entire flight.

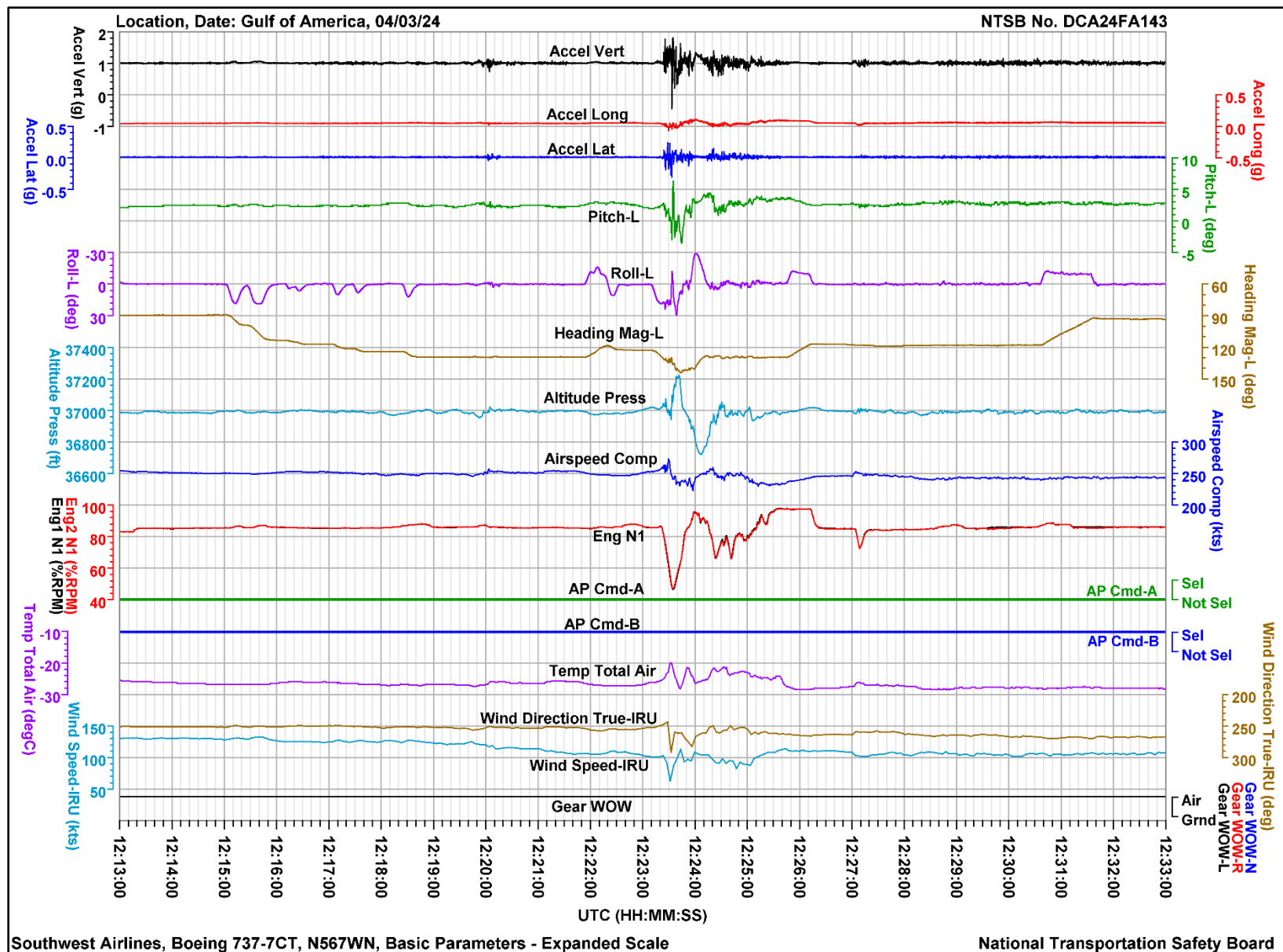


Figure 4. Plot of basic parameters with a 20-minute time span focusing on the upset encounter.

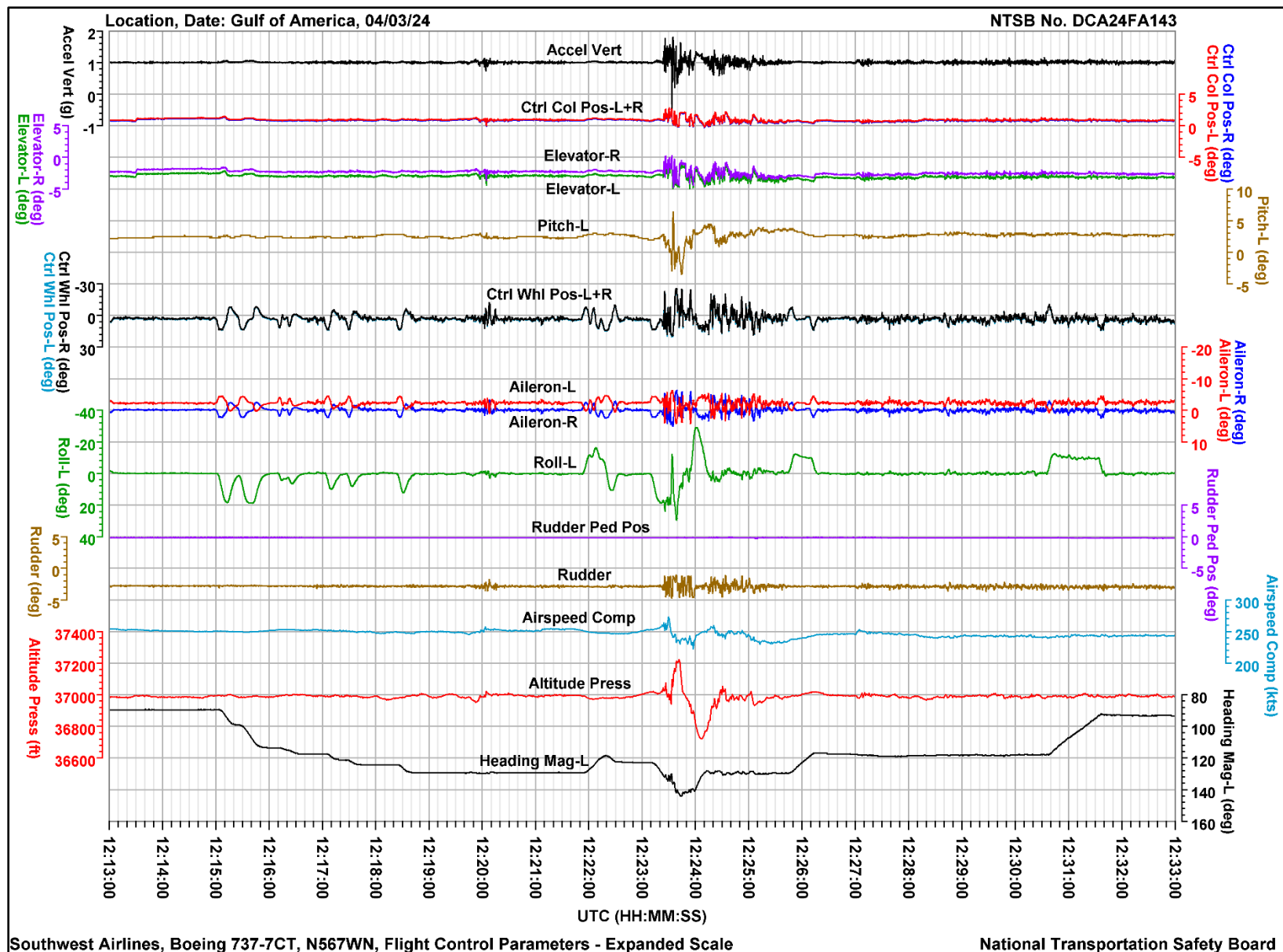


Figure 5. Plot of flight control parameters with a 20-minute time span focusing on the upset encounter.

APPENDIX A. VERIFIED AND PROVIDED PARAMETERS

This appendix describes the parameters provided and verified in this report. Table 1 lists the plot/table labels, parameter names, and units. Additionally, table 2 describes the unit and discrete state abbreviations used in this report.

Table 1. Verified and provided FDR parameters.

Plot/Table Labels	Parameter Names	Units
Accel Lat	Lateral Acceleration	g
Accel Long	Longitudinal Acceleration	g
Accel Vert	Vertical Acceleration	g
Aileron-L	Aileron Position-Left	deg
Aileron-R	Aileron Position-Right	deg
Airspeed Comp	Computed Airspeed	kts
Altitude Press	Pressure Altitude	ft
AP Cmd-A	Autopilot Command-A	
AP Cmd-B	Autopilot Command-B	
Ctrl Col Pos-L	Control Column Position-Captain	deg
Ctrl Col Pos-R	Control Column Position-First Officer	deg
Ctrl Whl Pos-L	Control Wheel Position-Captain	deg
Ctrl Whl Pos-R	Control Wheel Position-First Officer	deg
Elevator-L	Elevator Position-Left	deg
Elevator-R	Elevator Position-Right	deg
Eng1 N1	Engine 1 Fan Speed	%RPM
Eng2 N1	Engine 2 Fan Speed	%RPM
Gear WOW-L	Weight on Wheels-Left Main Landing Gear	
Gear WOW-N	Weight on Wheels-Nose Gear	
Gear WOW-R	Weight on Wheels-Right Main Landing Gear	
Heading Mag-L	Magnetic Heading-Left	deg
Latitude	Latitude Position	deg
Longitude	Longitude Position	deg
Pitch-L	Pitch Angle-Left	deg
Roll-L	Roll Angle-Left	deg
Rudder	Rudder Position	deg
Rudder Ped Pos	Rudder Pedal Position	deg
Temp Total Air	Total Air Temperature	degC
Time Clock GMT Hrs	Greenwich Mean Time Hours	hrs
Time Clock GMT Min	Greenwich Mean Time Minutes	min
Time Clock GMT Sec	Greenwich Mean Time Seconds	sec
Wind Direction True-IRU	Wind Direction True-Inertial Reference Unit	deg
Wind Speed-IRU	Wind Speed- Inertial Reference Unit	kts

Note: This FDR records pressure altitude, which is based on a standard altimeter setting of 29.92 inches of mercury (inHg). The pressure altitude information presented in the FDR plots and in the electronic data has not been corrected for the local altimeter setting at the time of the event.

Note: Parameters with a blank unit description in table 1 are discretes. A discrete is typically a 1-bit parameter that is either a 0 state or a 1 state where each state is uniquely defined for each parameter.

Table 2. Unit and discrete state abbreviations.

Unit and Discrete State Abbreviations	Descriptions
%RPM	percent revolutions per minute
deg	degrees
degC	degrees Celsius
ft	feet
g	unit of gravitation acceleration
Grnd	ground
hrs	hours
inHg	inches of mercury
kts	knots
min	minutes
Not Sel	not selected
sec	seconds
Sel	selected