

National Transportation Safety Board

Office of Research and Engineering

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CEN24LA367

COCKPIT DISPLAY - RECORDED FLIGHT DATA

Specialist's Factual Report

December 1, 2025

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A. ACCIDENT

Location: Lakeway, Texas
Date: September 25, 2024
Time: 1833 Central Daylight Time (CDT)
2333 Coordinated Universal Time (UTC)
Airplane: Cirrus SR22, N565CP

B. COCKPIT DISPLAY - RECORDED FLIGHT DATA SPECIALIST

Specialist: Christopher Babcock
Aerospace Engineer
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

A group was not convened. The NTSB Vehicle Recorder Division received data files from an SD card installed in a Cirrus Perspective MFD and a Heads Up Technologies Recoverable Data Module (RDM), serial number unknown.

Electronic File #1:	log_240925_221133_KTYR.csv
Electronic File #2:	RDM100_Records(8hr).txt

1.0 Cirrus Perspective MFD SD Card Description

The Cirrus Perspective integrated flight deck is based on the Garmin G1000 system and is a collection of multiple avionics units which include flight displays, air data computers, attitude/heading reference system (AHRS), communications and other systems. A typical installation includes a primary flight display (PFD) and a multi-function display (MFD). Each display includes two secure digital (SD) card slots, an upper and a lower slot. The lower SD card slot is used by the system for software updates and various databases.¹

Depending on the installed software, the display unit can include a data logging feature. The data logging feature must be enabled by the aircraft operator. If the data logging feature is available and enabled, a SD card must be installed in the upper slot of the MFD. Depending on the airframe and engine combination as many as 64 parameters can be stored at a rate of one sample per second (1Hz). According to the manufacturer of the display unit, one flight hour generates approximately 2 megabytes (MB) of data. The SD card typically used is 2 gigabyte (GB) in size and can store over 1,000 flight hours of data.

¹ Databases can include terrain data, obstacle data, SafeTaxi charts, flight charts and airport terrain databases

1.1 Cirrus Perspective MFD SD Data Card File Description

The accident flight recording was identified and was approximately 83 minutes in duration.

1.1.1 Cirrus Perspective MFD SD Data Card Engineering Unit Conversions

The flight log data stored in the individual files was converted to engineering units by the display unit.

Table 1 in Appendix A lists the parameters verified and provided in this report.

1.2 Cirrus Perspective MFD SD Data Card Time Correlation

The Cirrus Perspective MFD SD card records time with the first data sample based on the GPS time. Flight data was recorded in local time in the flight data log file, so no further correlation was necessary. The last data point was recorded at 1833:31 CDT.

2.0 Heads Up Technologies RDM Description

The Heads Up Technologies recoverable data module (RDM) is a crash-hardened data storage unit installed in the tail of some Cirrus aircraft. The unit records flight, engine, and autopilot parameters. Data is logged once per second and stored inside the crash-hardened enclosure. When the storage limit of the memory device is reached, the oldest recording is deleted.

2.1 Heads Up Technologies RDM File Description

The accident flight recording was identified and was approximately 83 minutes in duration. The last data point was recorded at 1833:17 CDT, although several parameters, including AHRS data, stopped recording at 1833:09 CDT.

2.1.1 Heads Up Technologies RDM Engineering Unit Conversions

The RDM file was parsed using the RDM Output Sentence Specification document into engineering units.

Table 1 in Appendix A lists the parameters verified and provided in this report.

2.2 Heads Up Technologies RDM Time Correlation

The RDM records time in UTC based on the GPS time. The RDM was offset by subtracting 5 hours to convert to local CDT.

D. FIGURES AND TABULAR DATA

Figures 1 to 4 contain flight data recorded during the event on September 25, 2024. All the parameters listed in Table 1 are plotted except latitude and longitude. Because many parameters were duplicated on the RDM and SD card, the parameters plotted were recorded with the most precision. Figure 5 contains a Google Earth image with an overlay of the flight track of the final 2 minutes of flight. Weather and lighting conditions may not reflect those present at the time of the accident.

Figure 1 shows basic flight data for the entire recording. Figure 2 shows basic flight data from the last two minutes of the recording. Figure 3 shows engine data from the entire recording. Figure 4 shows engine data from the last 2 minutes of the recording.

These figures are configured such that right turns are indicated by the trace moving toward the bottom of the page and left turns towards the top of the page.

The aircraft departed from runway 4 at the Tyler Pounds Regional Airport (KTYR), Tyler, Texas, at 1727:40 CDT and turned to the southwest and climbed to 6770 feet GPS altitude with the autopilot engaged.

At 1820:30 CDT, aircraft began descending and leveled off at about 1900 feet GPS altitude. At 1830:09 CDT, the autopilot was disconnected. At 1830:30 CDT, the aircraft turned to the south, entering a left downwind for runway 34 at Lakeway Airpark (3R9), Lakeway, Texas. At 1831:40 CDT, the aircraft turned base, extended flaps to 100% at 1832:06 CDT, and turned final at 1832:16 CDT at 1314 feet GPS altitude and 85 knots indicated airspeed.

The stall warning activated for about one second at 1833:09 CDT. At about 1833:10 CDT, the aircraft began deviating to the left of the extended runway centerline and began climbing. Engine RPM increased to nearly full power at this time. At this point the aircraft was over the displaced threshold. The stall warning activated again at 1833:11 CDT. The aircraft began descending at 1833:17 CDT and impacted terrain.

The corresponding tabular data used to create Figures 1 through 5 are provided in electronic comma-separated value (CSV) format as attachment 1 to this report.

Submitted by:

Christopher Babcock
Aerospace Engineer

Private, Cirrus SR22, N565CP

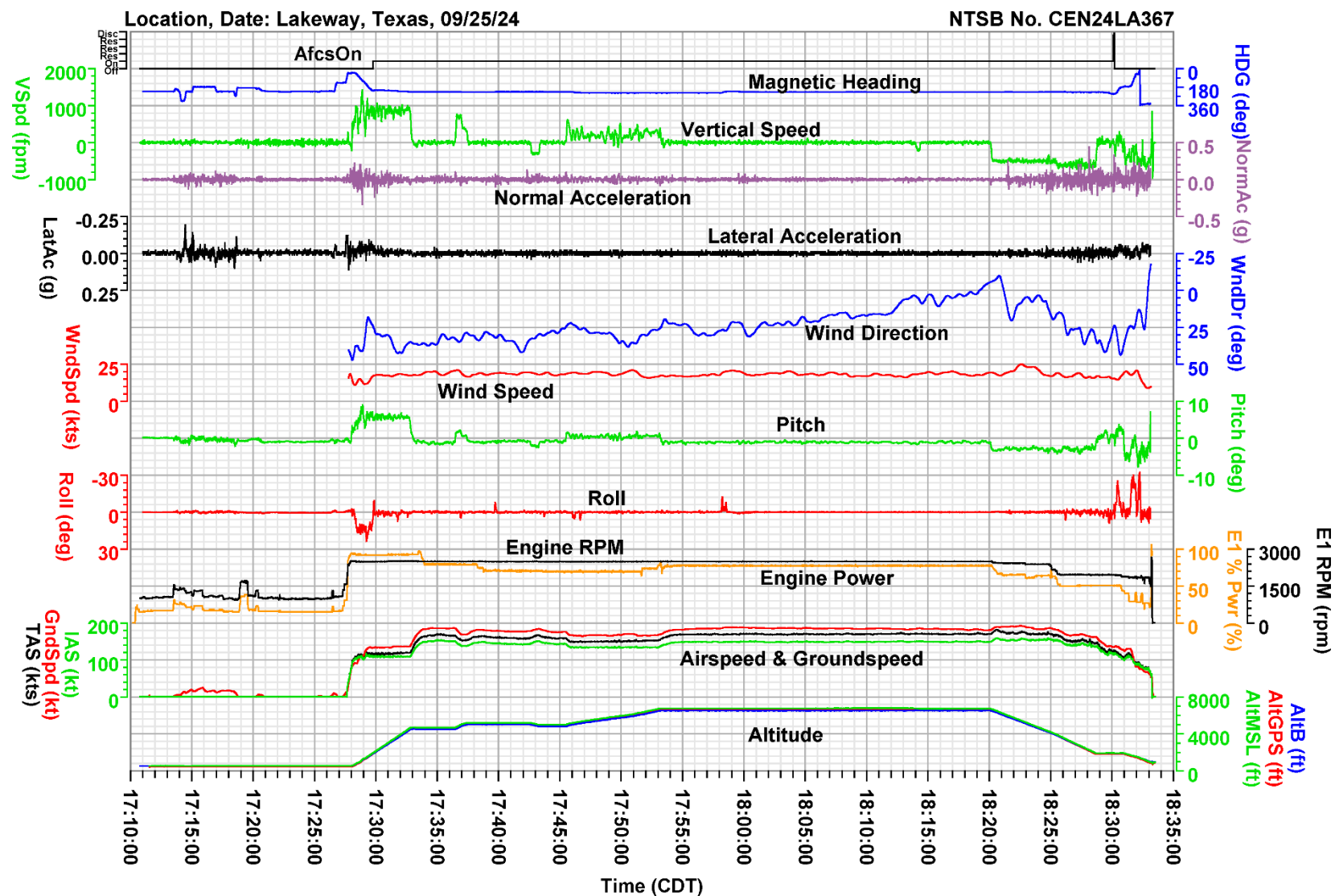


Figure 1. Plot of basic flight data for entire accident recording.

Private, Cirrus SR22, N565CP

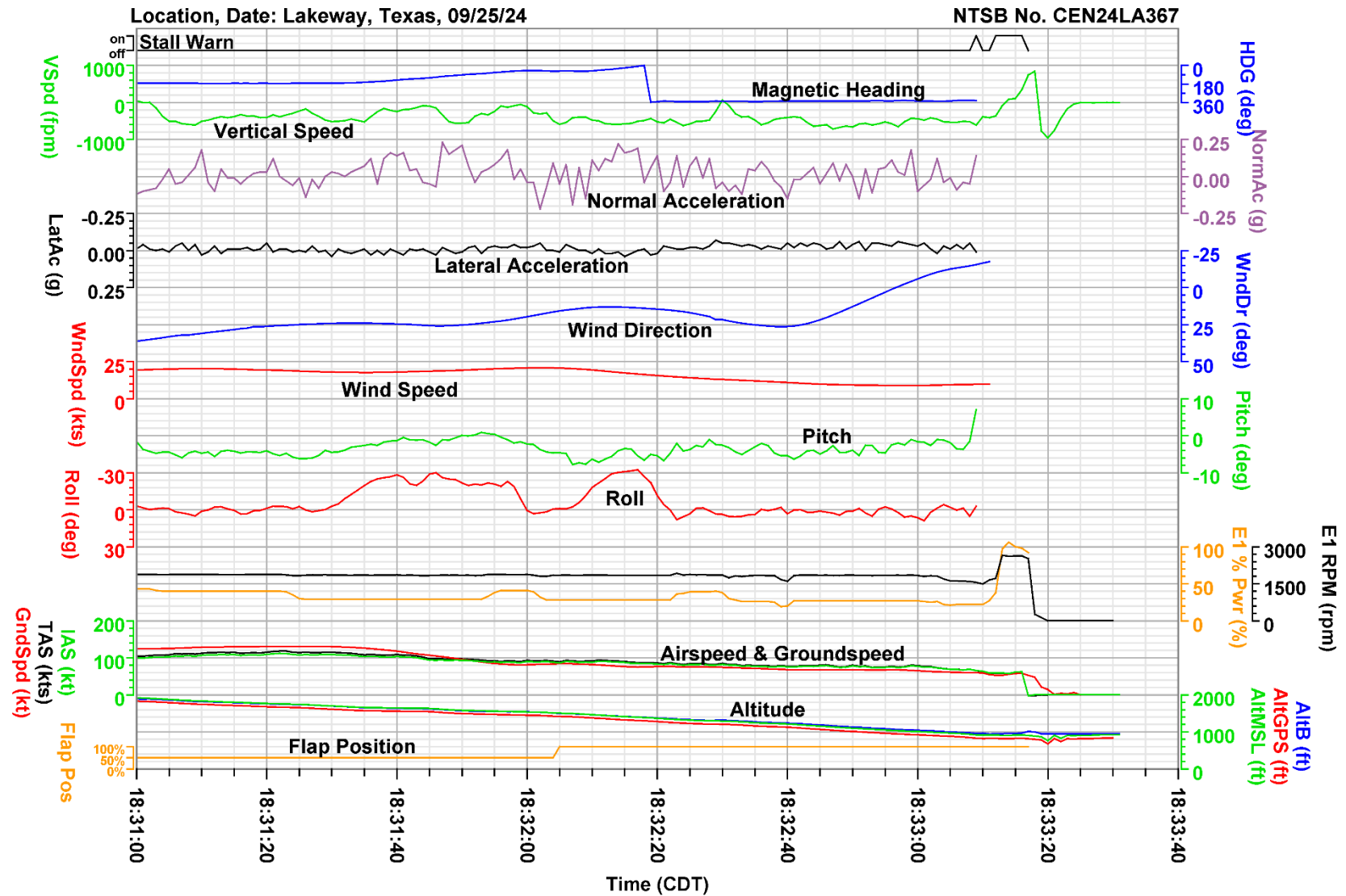


Figure 2. Basic flight data from last two minutes of accident recording.

Private, Cirrus SR22, N565CP

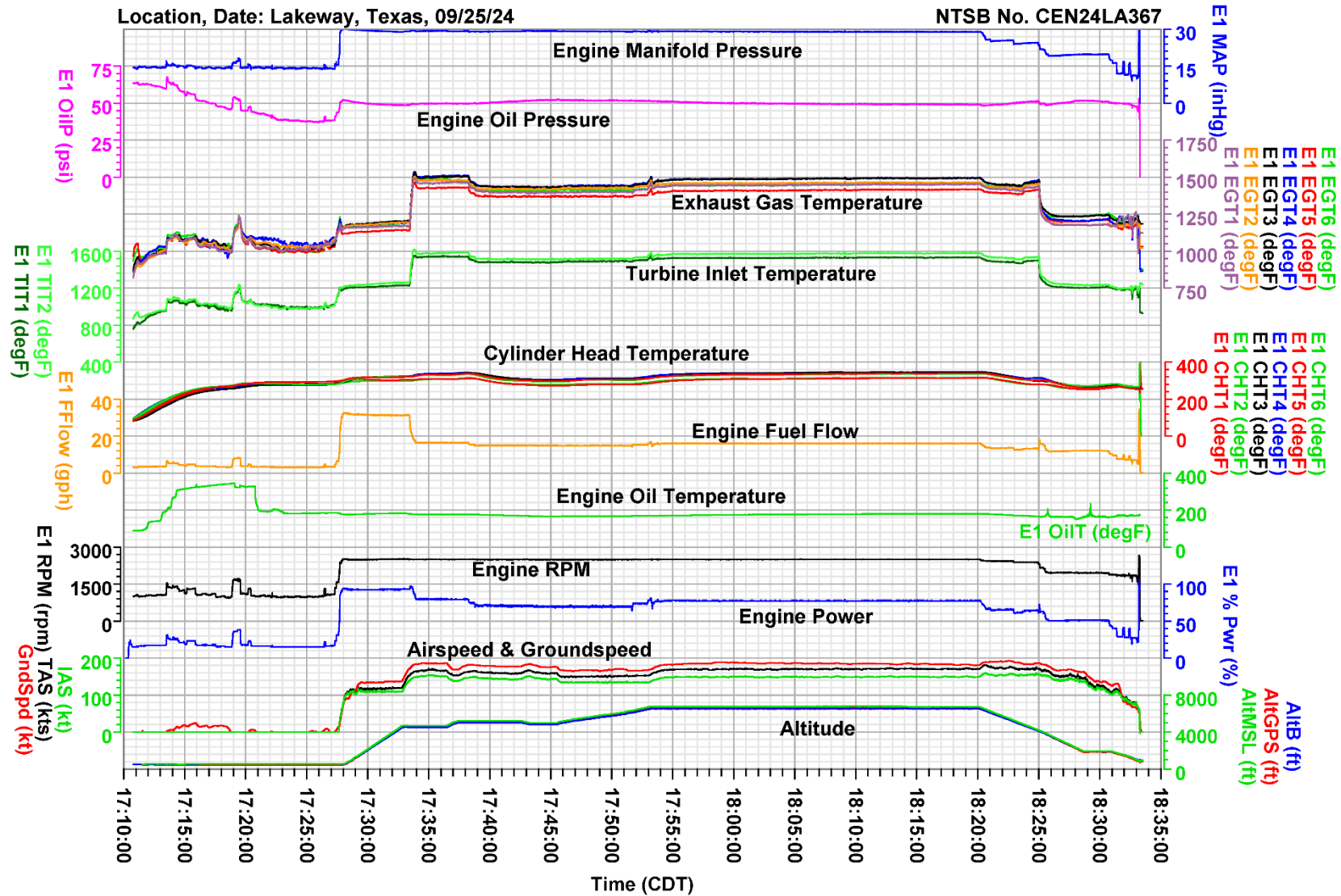


Figure 3. Plot of Engine data for entire accident recording.

Private, Cirrus SR22, N565CP

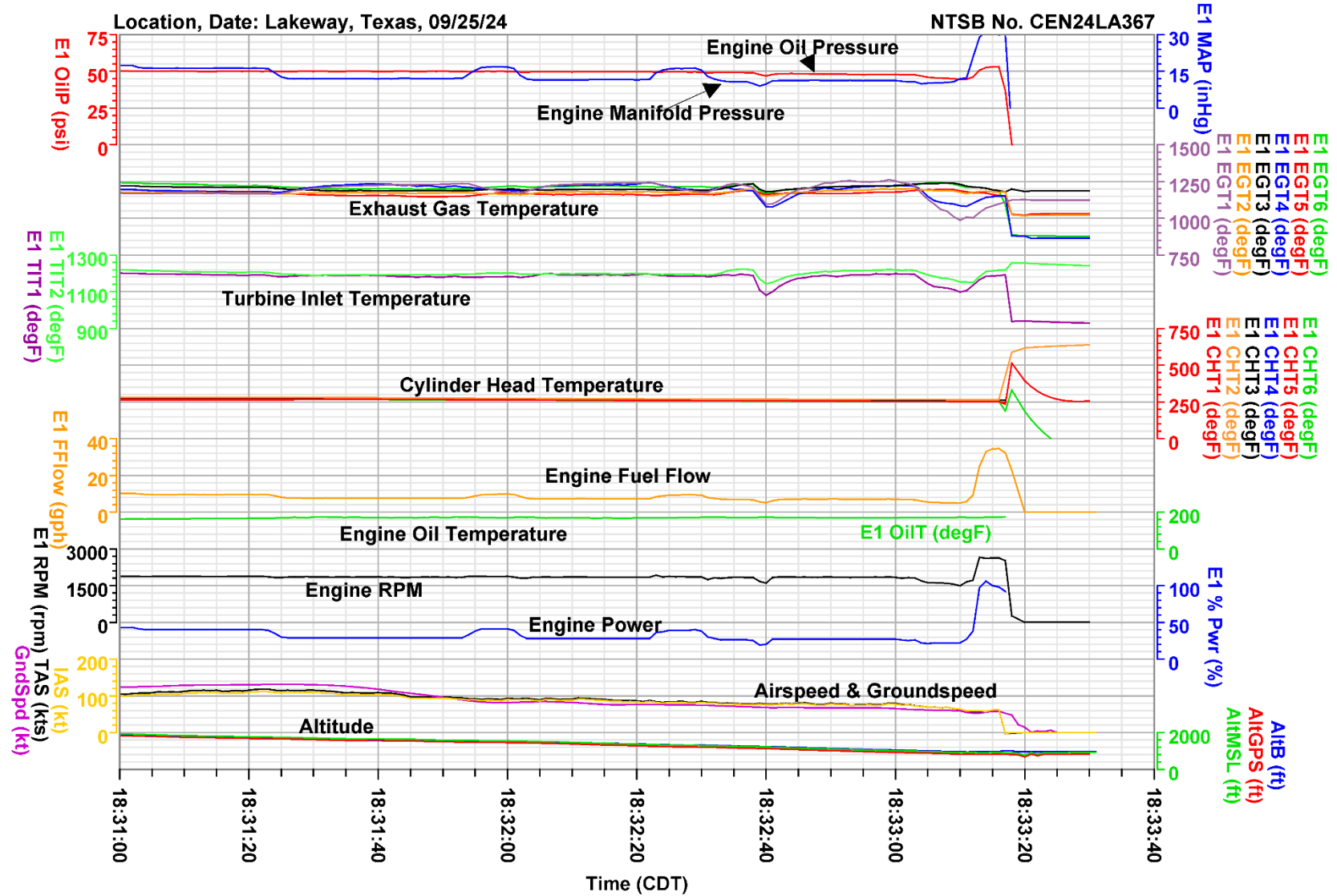


Figure 4. Plot of engine data from end of accident flight.

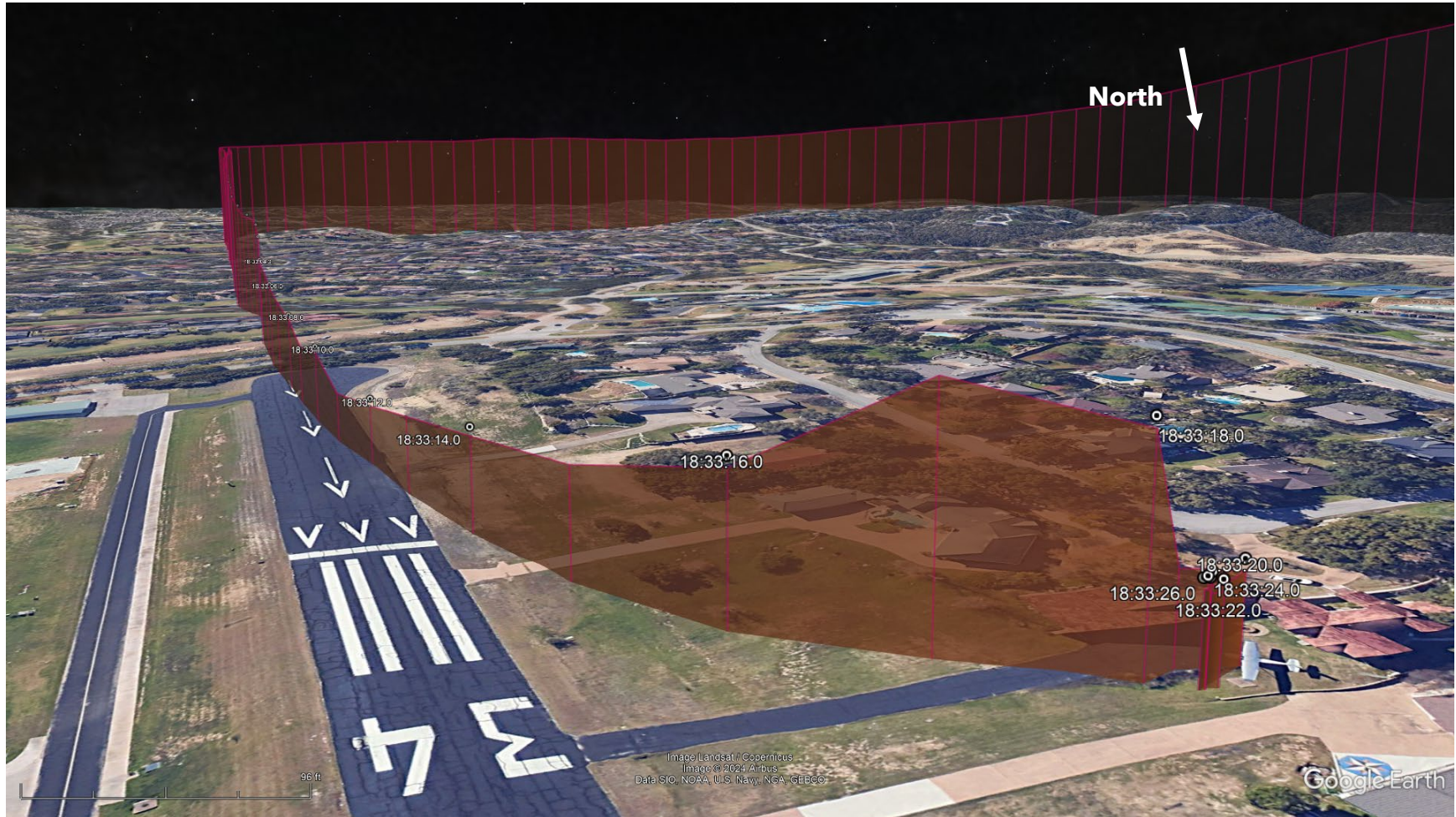


Figure 5. Google Earth with flight track overlay of landing approach.

APPENDIX A. VERIFIED AND PROVIDED PARAMETERS

This appendix describes the parameters provided and verified in this report. Table 1 lists the G1000NXi parameters and Table 2 describes the unit abbreviations used in this report.

Table 1. Verified and provided parameters.

Parameter Name (units)	Parameter Description	Source
AfcsOn (discrete)	Automatic Flight Control System On	SD Card
AltB (ft)	Barometric Altitude	SD Card
AltGPS (ft)	Geometric Altitude	SD Card
AltMSL (ft msl)	Pressure Altitude	SD Card
E1 Pct Power	Engine 1 Percent Power	RDM
E1 CHT# (degF)	Cylinder Head Temperature Cylinder # ²	SD Card
E1 FF (gph)	Engine 1 Fuel Flow	SD Card
E1 MAP (inHg)	Engine 1 Manifold Pressure	SD Card
E1 OilP (psi)	Engine 1 Oil Pressure	SD Card
E1 OilT (degF)	Engine 1 Oil Temperature	SD Card
E1 RPM (rpm)	Engine 1 Revolutions per minute	SD Card
E1 TIT1 (degF)	Engine 1 Turbine Inlet Temperature 1	SD Card
E1 TIT2 (degF)	Engine 1 Turbine Inlet Temperature 2	SD Card
Flap Pos	Flap Position	RDM
GndSpd (kts)	Ground Speed	SD Card
HDG (deg)	Magnetic Heading	SD Card
IAS (kts)	Indicated Airspeed	SD Card
LatAc (g)	Lateral Acceleration	SD Card
Latitude (deg)	Latitude	SD Card
Longitude (deg)	Longitude	SD Card
NormAc (g)	Normal Acceleration	SD Card
Pitch (deg)	Pitch	SD Card
Roll (deg)	Roll	SD Card
Stall Warn	Stall Warning	RDM
TAS (kts)	True Airspeed	SD Card
VSpd (fpm)	Vertical Speed	SD Card
Wind Dir (deg)	Wind Direction	SD Card
Wind Spd (kts)	Wind Speed	SD Card
WptBrg (deg)	Waypoint Bearing	SD Card

² Depending on aircraft configuration number of cylinders that are instrumented varies. In the data plots the '#' is replaced with the appropriate cylinder ID.

Table 2. Unit abbreviations.

Unit Abbreviations	Descriptions
deg	degrees
deg F	degrees Fahrenheit
disc	disconnect
ft	feet
fsd	full scale deflection
gph	gallons per hour
inHg	inches of Mercury
kts	knots
msl	mean sea level
psi	pounds per square inch
res	reserved
rpm	revolutions per minute

Note: For parameters with a unit description of discrete, 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.