

National Transportation Safety Board

Office of Research and Engineering

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ELECTRONIC DEVICES

Specialist's Factual Report

September 23, 2025

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. ELECTRONIC DEVICES SPECIALIST	3
C. DETAILS OF THE INVESTIGATION	3
1.0 SENTRY PLUS DESCRIPTION	3
1.1 Sentry Plus Data Recovery	4
1.2 Sentry Plus Recording Description	4
1.2.1 Sentry Plus Engineering Unit Conversions	4
1.3 Sentry Plus Time Correlation	5
2.0 EDM-830 DESCRIPTION	5
2.1 EDM-830 Data Recovery	5
2.2 EDM-830 Recording Description	6
2.2.1 EDM-830 Engineering Unit Conversions	6
2.3 EDM-830 Time Correlation	6
D. FIGURES AND TABULAR DATA	7
APPENDIX A. VERIFIED AND PROVIDED PARAMETERS FROM SENTRY PLUS AND EDM-830	14

A. ACCIDENT

Location: Wedgefield, Florida
Date: March 12, 2025
Time: 1450 eastern daylight time (EDT)
Airplane: Cessna TU206G, Gpi Geospatial Inc., N27GP

B. ELECTRONIC DEVICES SPECIALIST

Specialist: Matthew Yandrick
Electrical Engineer – Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

A group was not convened.

The NTSB Vehicle Recorder Division received the following electronic devices:

Recorder Manufacturer/Model:	Sentry Plus FFSEN3
Recorder Serial Number:	8512956
Recorder Manufacturer/Model:	JPI EDM-830
Part Number:	EGT-701-6C
Recorder Serial Number:	33209

1.0 Sentry Plus Description

The Sentry Plus receiver is a portable ADS-B and GPS receiver with a 1.3-inch organic light-emitting diode (OLED) screen that displays real-time accelerometer, carbon monoxide (CO) status, speed, and GPS accuracy data.¹ The unit also generates a Wi-Fi network which allows portable electronic devices like smart phones and tablet devices with ForeFlight to connect and exchange data.²

¹ Automatic Dependent Surveillance-Broadcast (ADS-B) is a surveillance technology deployed throughout the national airspace system. The ADS-B system is composed of aircraft avionics and a ground infrastructure. Onboard avionics determine the position of the aircraft by using the GPS and transmit its position along with additional information about the aircraft to ground stations for use by air traffic control (ATC) and other ADS-B services. This information is transmitted at a rate of approximately once per second. Operators equipped with ADS-B realize additional benefits from ADS-B broadcast services: Traffic Information Service - Broadcast (TIS-B) (traffic information) and Flight Information Service - Broadcast (FIS-B) (weather information).

² ForeFlight is an iOS Device app (program) that communicates wirelessly with the Sentry device to display aircraft's attitude, navigation, weather, and traffic information.

Sentry Plus records flight log data each time the device is powered on and continues recording until it is powered off. Data is stored on an internal microSD card at a 1 hertz (Hz) sample rate. Parameters include position, velocity, GPS quality, GPS accuracy, barometric altitude, GPS altitude, course over ground, course turn rate, and accelerations.

1.1 Sentry Plus Data Recovery

The Sentry Plus was in good condition (see Figure 1) and the data were downloaded using the manufacturer's procedure.



Figure 1. Front (left) and back (right) view of Sentry Plus, as received.

1.2 Sentry Plus Recording Description

The data extracted included 16 track logs from March 2, 2025, through March 12, 2025. The accident flight was the last track log that started recording at 14:21:50 EDT and ended at 15:20:09 EDT on March 12, 2025.

1.2.1 Sentry Plus Engineering Unit Conversions

Altitude data, as provided by Sentry Plus, were converted from millimeters (mm) to feet (ft). Additionally, North and East velocities were used to derive the GPS groundspeed parameter, and the units were converted from millimeters per second (mm/s) to knots (kts).

1.3 Sentry Plus Time Correlation

The Sentry plus recorded time in epoch time. Epoch time was converted to coordinated universal time (UTC), followed by subtracting 4 hours to get local time, EDT.

2.0 EDM-830 Description

The J. P. Instruments EDM-830 is a panel mounted LCD display that the operator can monitor and record up to 24 parameters related to engine operations. Depending on the installation, engine parameters monitored can include:

- Exhaust Gas Temperature (EGT)
- Cylinder Head Temperature (CHT)
- Oil Pressure and Temperature
- Manifold Pressure
- Outside Air Temperature
- Turbine inlet Temperature
- Engine Revolutions per Minute
- Compressor Discharge Temperature
- Fuel Flow
- Carburetor Temperature
- Battery Voltage

The unit can also calculate, in real-time, horsepower, fuel used, shock cooling rate, and EGT differentials between the highest and lowest cylinder temperatures. The calculations are also based on the aircraft installation.

The unit contains non-volatile memory for data storage of the parameters recorded and calculated. The rate at which the data is stored is selectable by the operator from 2 to 500 seconds per sample. The memory can store up to 20 hours of data at a 6 second sample rate. For a non-damaged unit, the data can then be downloaded by the operator using a USB flash drive and following the instructions on the unit.

2.1 EDM-830 Data Recovery

The EDM-830 was in good condition (see Figure 2) and data were downloaded using the manufacturer's procedure.

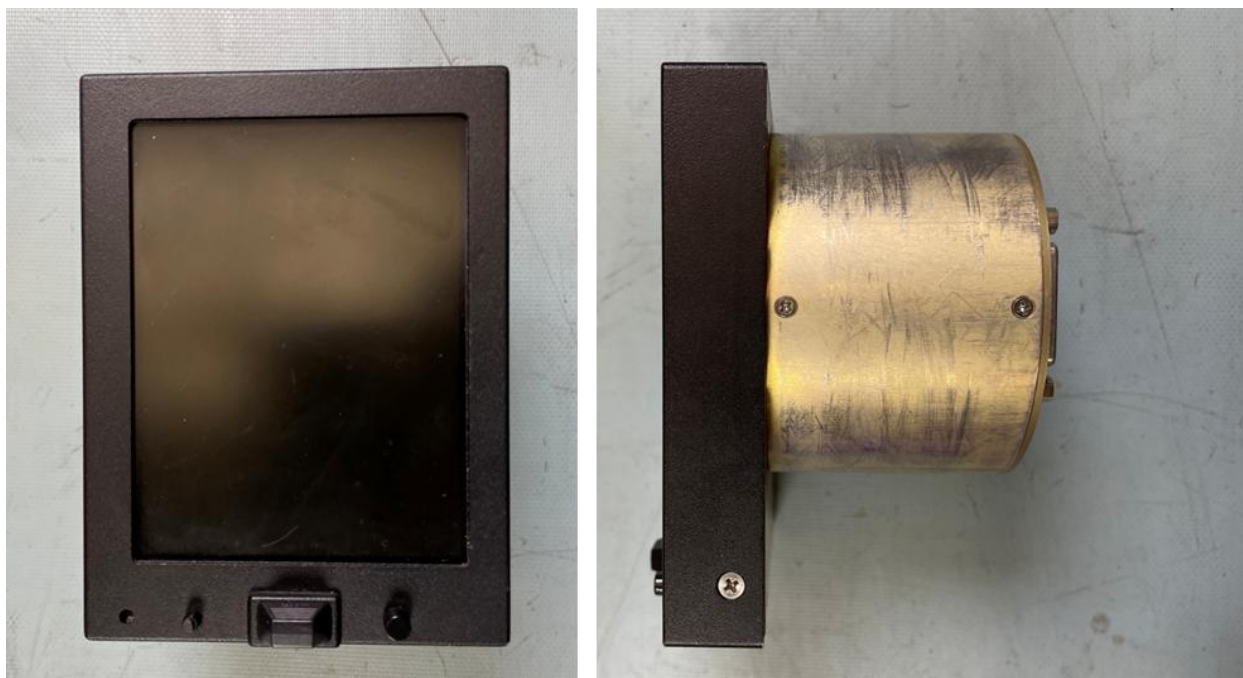


Figure 2. Front (left) and side (right) view of EDM-830, as received.

2.2 EDM-830 Recording Description

The EDM recording contained engine information from 38 logs from January 17, 2025, through March 12, 2025. The accident flight was the last flight log and its duration was approximately 29 minutes and 25 seconds. The device recorded data at a 5 second per sample rate (0.2 Hz).

2.2.1 EDM-830 Engineering Unit Conversions

There were no engineering units conversions applied to the EDM data. The engineering units used in this report are based on documentation from the manufacturer of the EDM.

2.3 EDM-830 Time Correlation

The EDM recorded time with the first data sample based on the unit's internal clock which is set and updated by the operator. Upon powering, the internal time was found to be offset from EDT by approximately 1 hour, 17 minutes, and 52 seconds. Correlation to EDT was calculated by utilizing the Senty Plus GPS data and correlating to when EDM parameters indicated that takeoff power was applied. This yielded a 4,672 second offset which was applied to the EDM data by subtracting 1 hour, 17 minutes, and 52 seconds such that time would be displayed in EDT, local time.

D. FIGURES AND TABULAR DATA

Figure 3 and Figure 4 are Google Earth overlays of the accident flight recorded on the Sentry Plus. The weather and lighting conditions in Google Earth do not represent the conditions present at the time of the accident flight. Figure 3 shows the ground track from departure at Orlando Executive Airport (ORL), Orlando, FL, to a field in the Wedgefield neighborhood of Orlando, Florida. Figure 4 shows the end of the accident flight with the associated data points that include a timestamp, GPS altitude, and groundspeed. The reported wreckage location matches that of the last recorded GPS data.

Figure 5 is a plot of parameters of the accident flight recorded on the Sentry Plus. The time displayed is 14:21:00 EDT to 14:51:00 EDT.

Figure 6 is a plot of engine parameters of the entire accident flight recorded on the EDM-830. The time displayed is 14:20:00 EDT to 14:51:00 EDT.

Figure 7 is a plot of parameters for approximately the final 3 minutes and 25 seconds of the accident flight recorded on the Sentry Plus. The time displayed is 14:47:15 EDT to 14:50:40 EDT.

Figure 8 is a plot of engine parameters for approximately the final 3 minutes of the accident flight recorded on the EDM-830. The time displayed is 14:47:15 EDT to 14:50:20 EDT.

The corresponding tabular data used to create Figure 3 to Figure 8 are provided in electronic comma-separated value (CSV) format as attachment 1 to this report.

Submitted by:

Matthew Yandrick
Electrical Engineer – Recorder Specialist

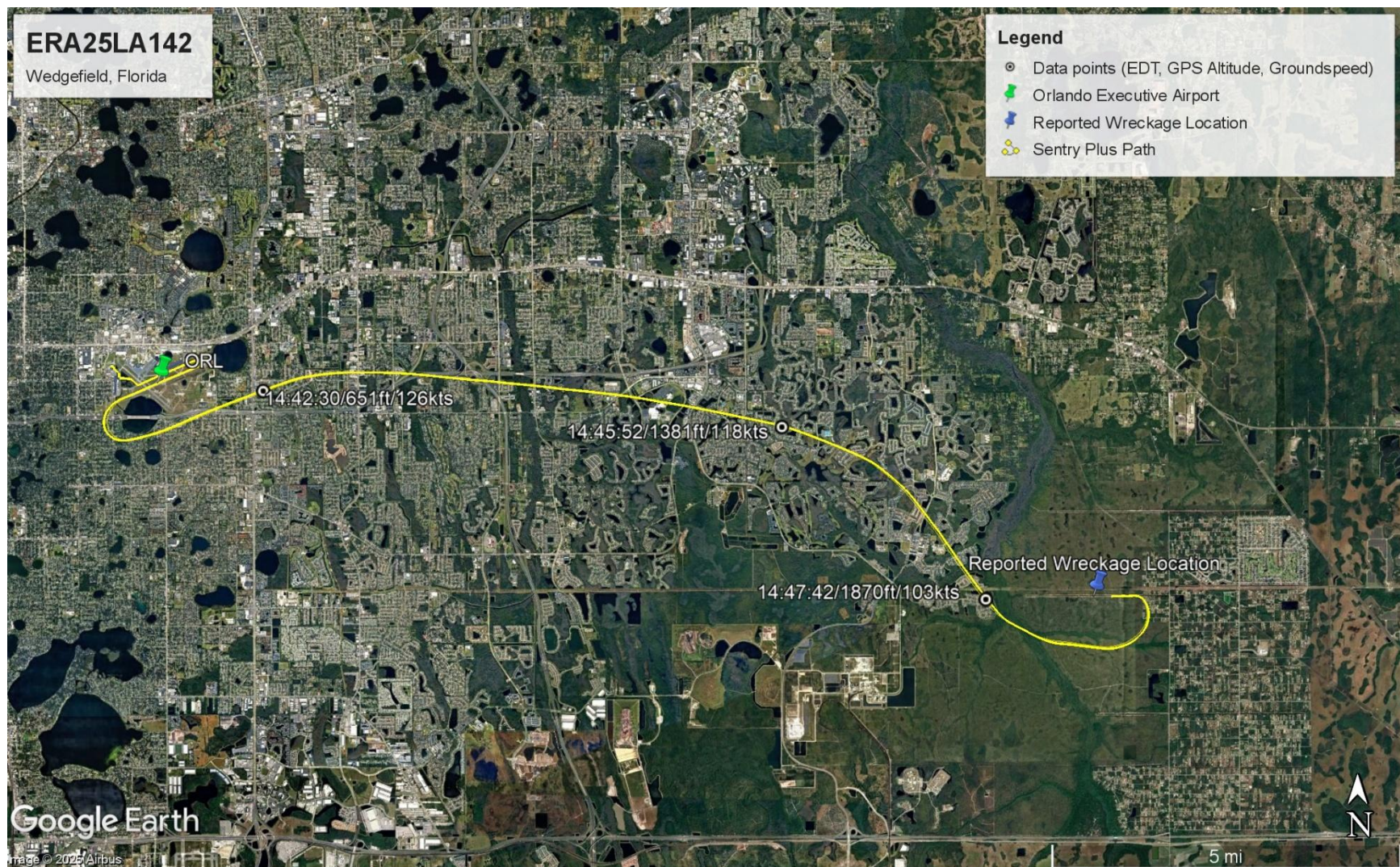


Figure 3. Google Earth overlay of the entire accident flight recorded on the Sentry Plus.

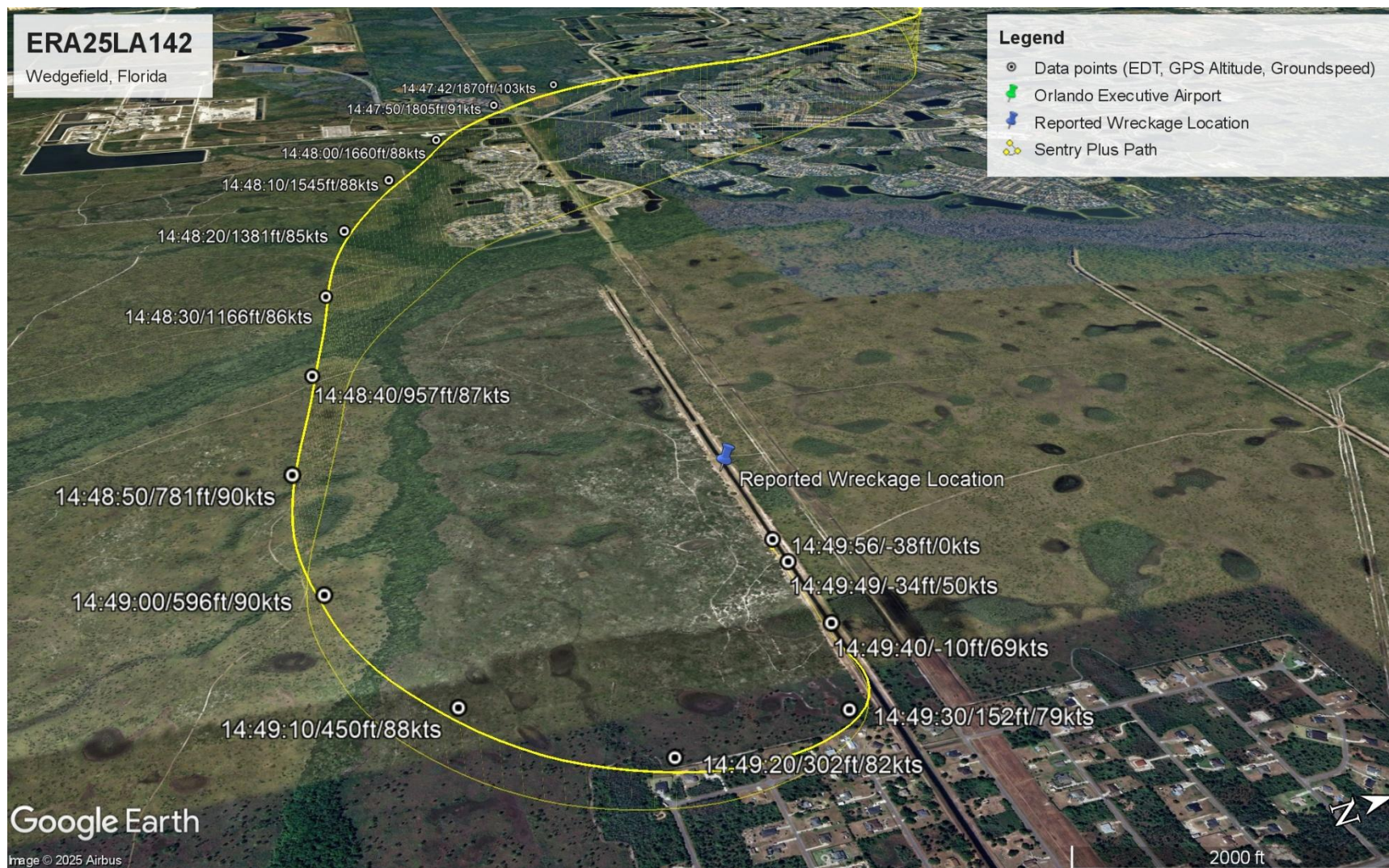


Figure 4. Google Earth overlay of the end of the accident flight recorded on the Sentry Plus.

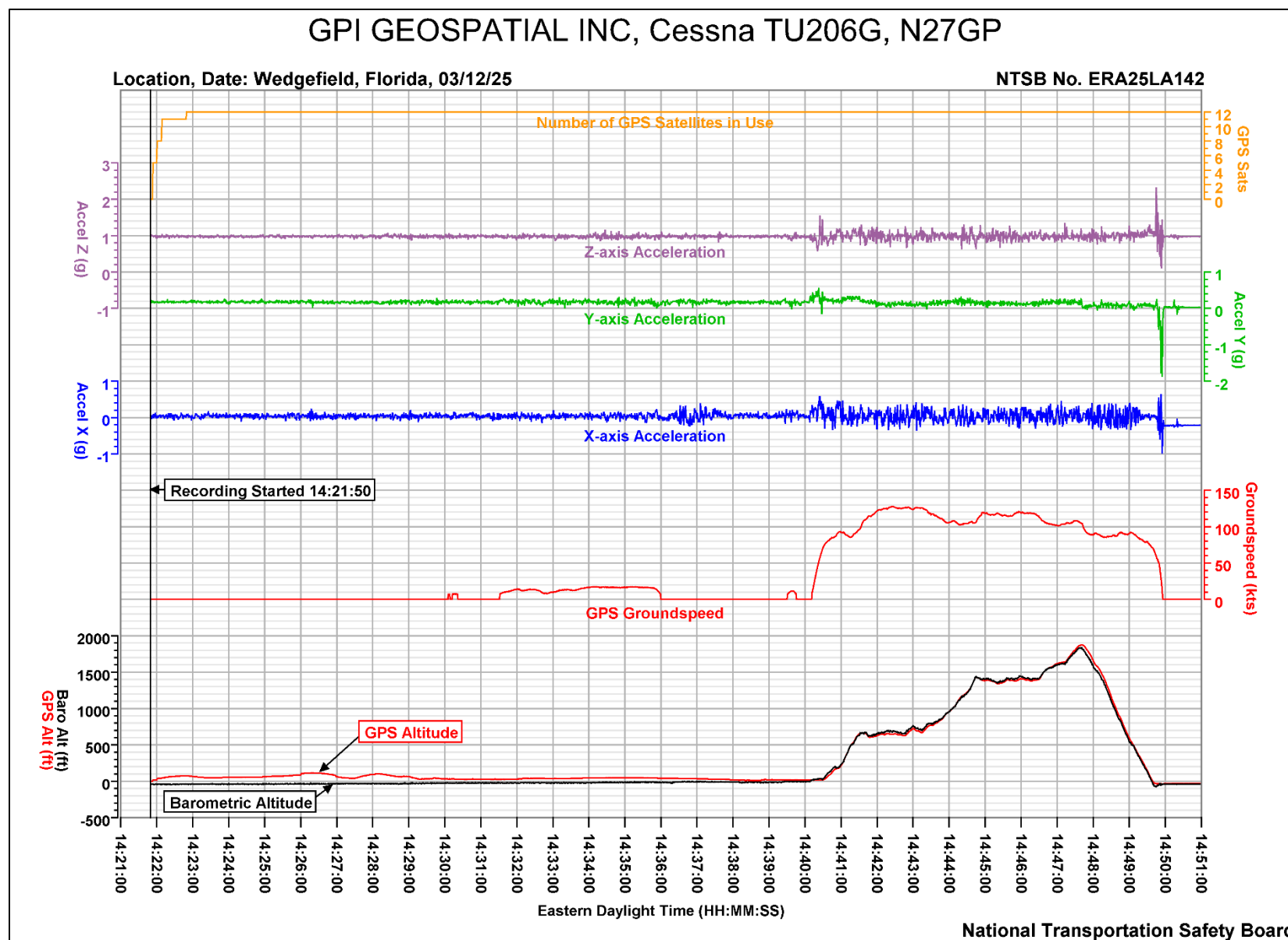


Figure 5. Plot of parameters for the accident flight recorded on the Sentry Plus.

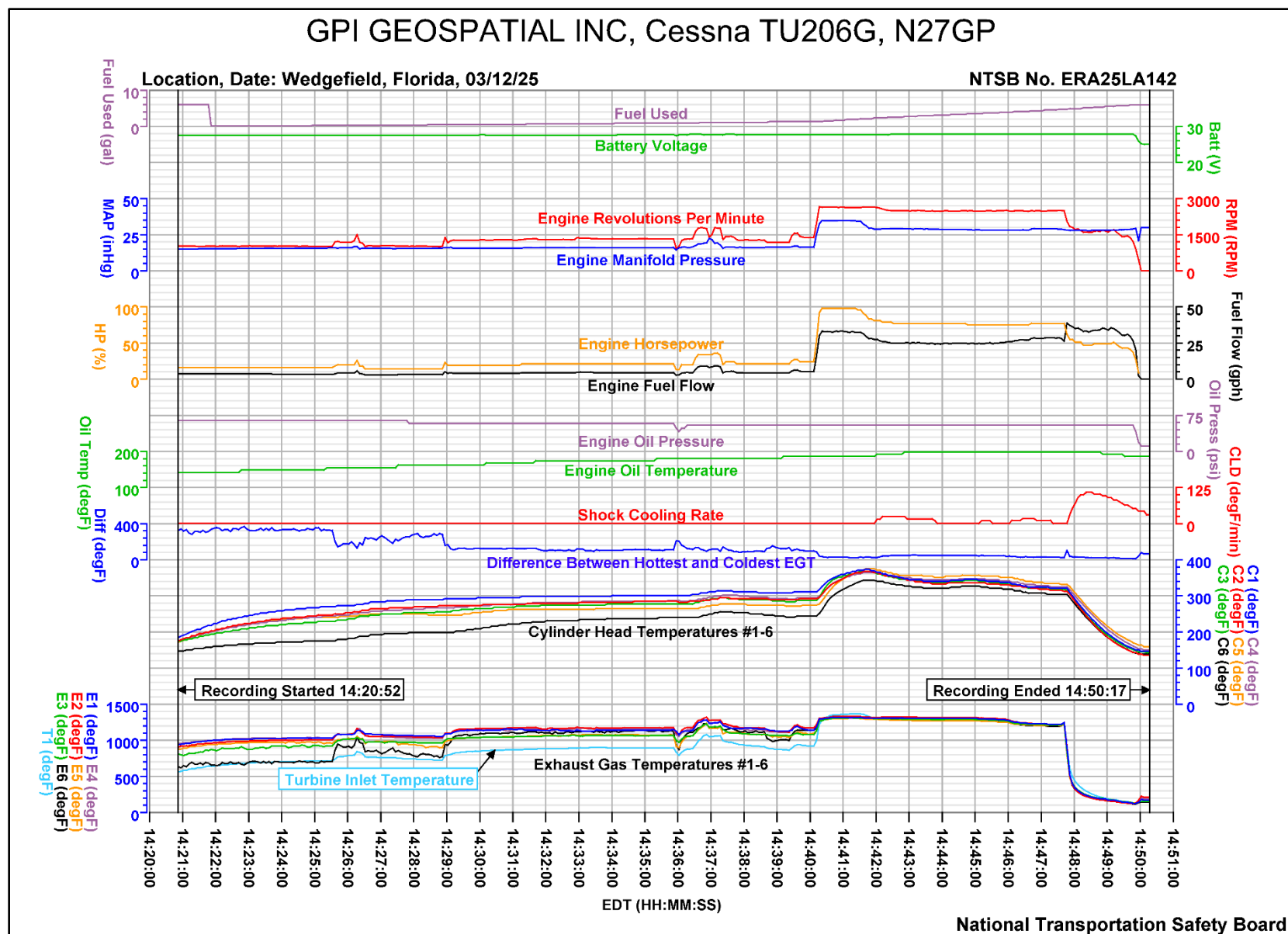


Figure 6. Plot of engine parameters for the entire accident flight recorded on the EDM-830.

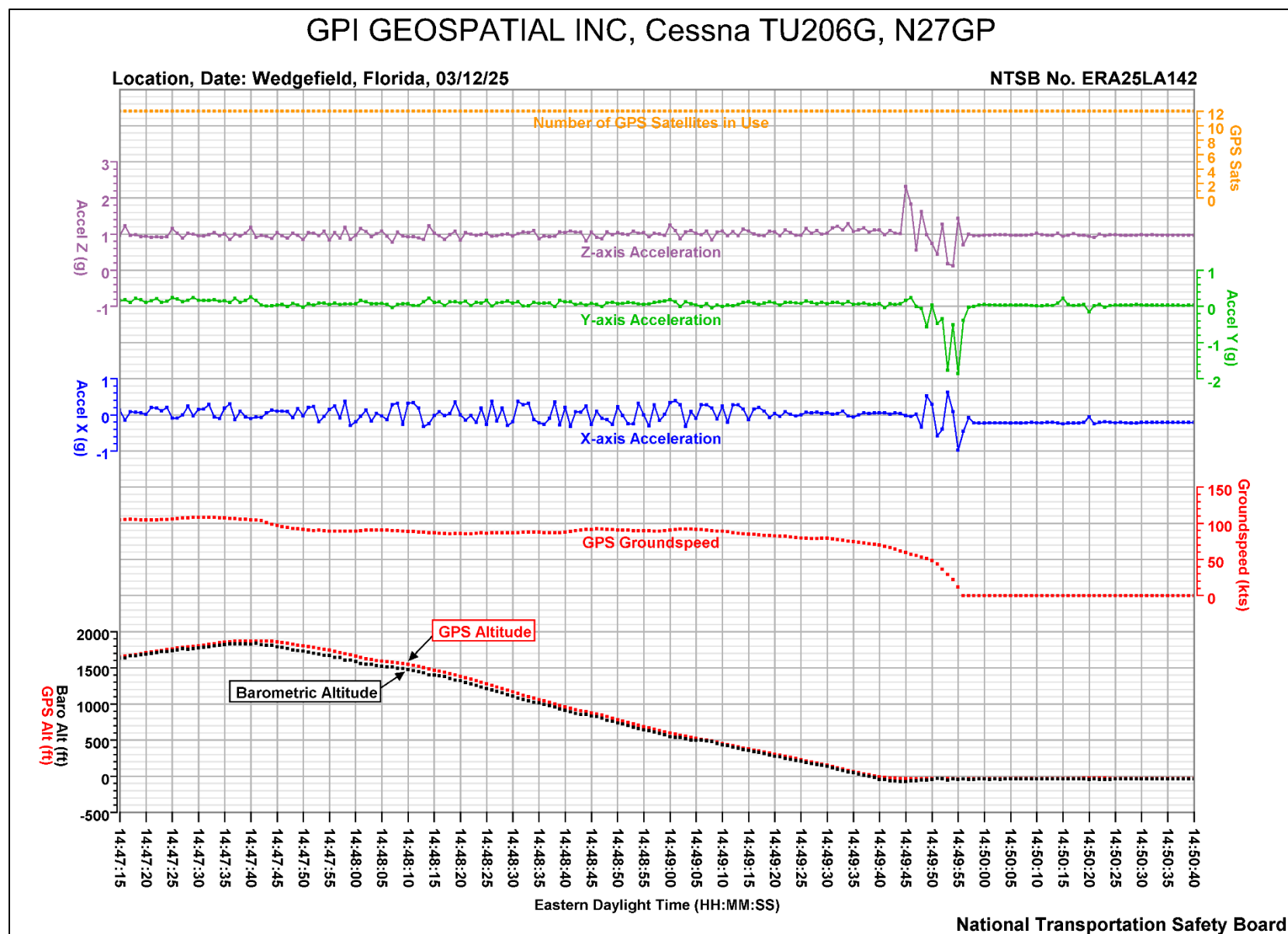


Figure 7. Plot of parameters for the approximately last 3 minutes and 25 seconds of the accident flight recorded on the Sentry Plus.

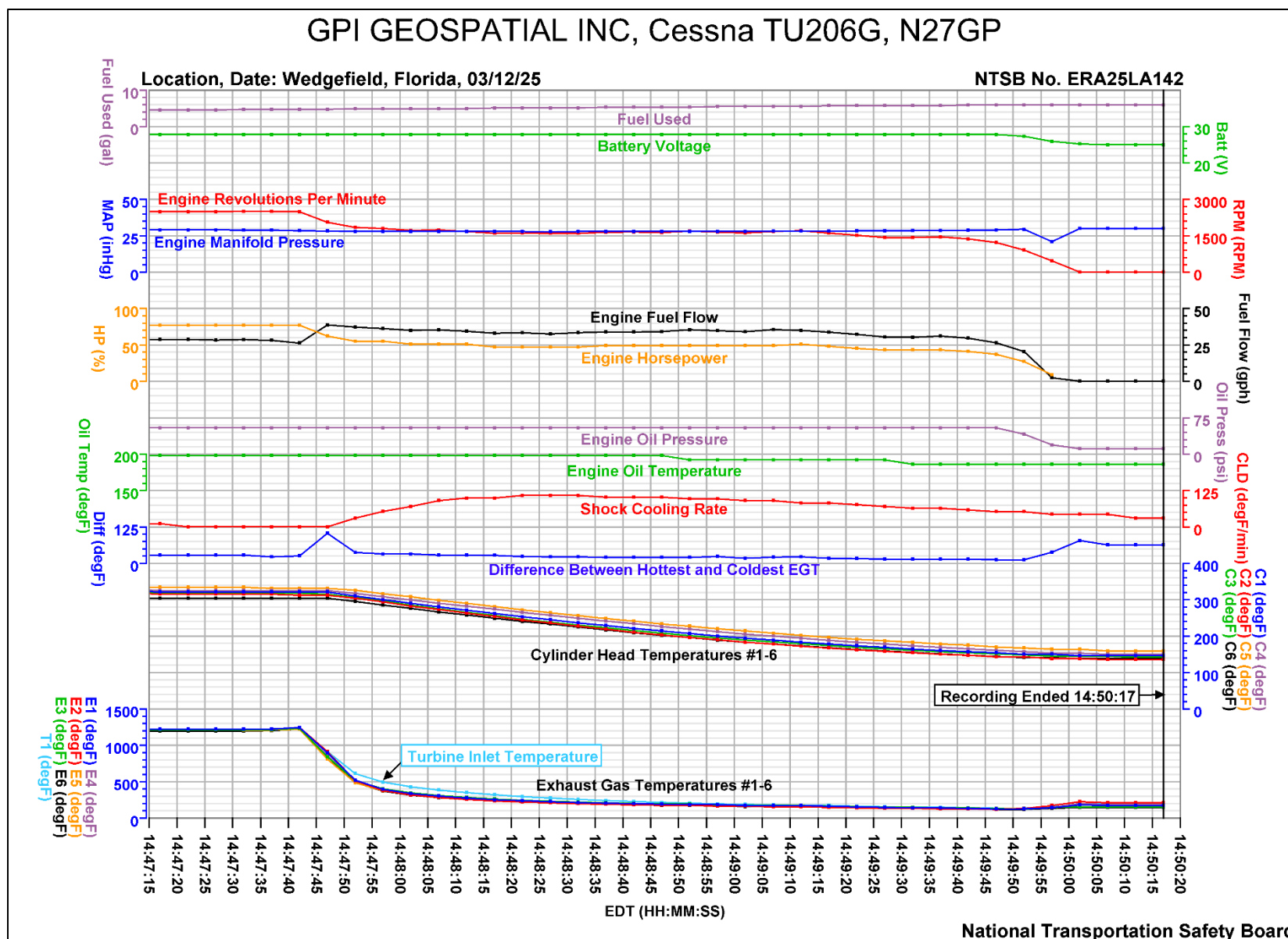


Figure 8. Plot of engine parameters for the last 3 minutes of the accident flight recorded on the EDM-830.

APPENDIX A. VERIFIED AND PROVIDED PARAMETERS FROM SENTRY PLUS AND EDM-830

This appendix describes the parameters provided and verified in this report. Table 1 lists the Sentry Plus and EDM-830 parameters and Table 2 describes the unit abbreviations used in this report.

Table 1. Verified and provided parameters.

Parameter Name	Parameter Description	Source
Date (MM/DD/YYYY)	Date for recorded data point (Month/Day/Year)	Sentry Plus
Time (HH:MM:SS)	Time (EDT) for recorded data point (Hour:Minutes:Seconds)	Sentry Plus
Accel X (g)	X-axis Acceleration	Sentry Plus
Accel Y (g)	Y-axis Acceleration	Sentry Plus
Accel Z (g)	Z-axis Acceleration	Sentry Plus
Baro Alt (ft)	Barometric Altitude	Sentry Plus
GPS Alt (ft)	Recorded GPS Altitude	Sentry Plus
GPS Sats	Number of GPS Satellites in Use	Sentry Plus
Groundspeed (kts)	Average derived groundspeed	Sentry Plus
Latitude (deg)	Recorded Latitude	Sentry Plus
Longitude (deg)	Recorded Longitude	Sentry Plus
Batt (V)	Battery Voltage	EDM-830
C# (degF)	Cylinder Head Temperature Cylinder # ³	EDM-830
CLD (deg/min)	Engine Shock Cooling Rate	EDM-830
Diff (degF)	EGT Max Differential highest and lowest cylinder	EDM-830
E# (degF)	Exhaust Gas Temperature Cylinder #	EDM-830
Fuel Flow (gph)	Engine Fuel Flow	EDM-830
Fuel Used (gal)	Engine Fuel Used	EDM-830
HP (%)	Engine Horsepower	EDM-830
MAP (inHg)	Engine Manifold Pressure	EDM-830
Oil Press (psi)	Engine Oil Pressure	EDM-830
Oil Temp (degF)	Engine Oil Temperature	EDM-830
RPM (RPM)	Engine Revolutions per minute	EDM-830
T1 (degF)	Engine Turbine Inlet Temperature-Input 1	EDM-830

Table 2. Unit abbreviations.

Unit Abbreviations	Descriptions
%	percent
deg	degrees
degF	Degrees Fahrenheit
deg/min	degrees per minute
ft	feet
g	unit of gravitational acceleration
gal	gallons

³ Depending on aircraft configuration number of cylinders that are instrumented varies. In the data plots the '#' is replaced with the appropriate cylinder ID.

Unit Abbreviations	Descriptions
gph	gallons per hour
inHg	inches of Mercury
kts	knots
psi	pounds per square inch
RPM	revolutions per minute
V	Volts DC