

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

February 26, 2020

Electronic Device

Specialist's Factual Report by Gerald Kawamoto

1. EVENT

Location: New Bedford, MA
Date: November 4, 2019
Aircraft: Cessna 150
Registration: N714LK
Operator: Private
NTSB Number: ERA20FA031

On November 4, 2019, at 1532 eastern standard time, a Cessna 150, N714LK, was destroyed when it impacted a cemetery in New Bedford, Massachusetts. The private pilot was fatally injured. The airplane was operated by the pilot as a personal flight conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight. The flight originated from the New Bedford Regional Airport (EWB), New Bedford, Massachusetts, around 1450.

2. GROUP

A group did not convene.

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following electronic device:

Device: **Stratus 3i**
Device Serial Number: **001579**

3.1. Device Description

The Appareo Status 3i is a wireless non-certified portable receiver capable of providing pilots with Wide Area Augmentation System¹ (WAAS) GPS position, weather and traffic information. The device receives Automatic Dependent Surveillance Broadcast (ADS-B) and records position, speed, attitude, and uncorrected barometric altitude data during

¹ The WAAS is an air navigation aid to augment the GPS, by improving its accuracy, integrity, and availability.

flight. The device communicates wirelessly with compatible devices, such as an iPad running compatible applications, such as ForeFlight² to display all acquired information.

3.2. Data Recovery

Upon arrival at the Vehicle Recorder Division, the exterior of the device did not exhibit major signs of damage, as shown in Figure 1. However, internal components appeared to be dislodged and could be audibly observed when the device was moved. An interior examination confirmed that internal components had sustained damage, as shown in Figure 1. The non-volatile memory³ chip was removed, read out, and converted to engineering units using laboratory tools.

Figure 1. Exterior of the Appareo Stratus 3i.



Figure 2. Dislodged and broken internal components of the Appareo Stratus 3i.



² iOS Device application capable of displaying the aircraft's altitude, navigation, weather, and traffic information. The application can be used for flight planning, charts, airport information, document management, and flight logging.

³ Non-volatile memory (NVM) is semiconductor memory that does not require external power for data retention.

3.3. Data Description

The data extracted included sessions from June 9, 2019⁴, through November 4, 2019. The session determined to be relevant to the accident event was parsed out and started at 19:45:49 UTC and ended at 20:33:01 UTC on November 4, 2019.

3.4. Parameters Provided

Table 1 describes data parameters recorded and derived by the device.

Table 1: Appareo Stratus 3i Parameters

Parameter Name	Parameter Description
Date	Date for recorded data point (MM/DD/YYYY)
Time	Time (UTC) for recorded data point (HH:MM:SS)
Latitude	Recorded Latitude (degrees)
Longitude	Recorded Longitude (degrees)
Acceleration X	Acceleration in X-Axis (g)
Acceleration Y	Acceleration in Y-Axis (g)
Acceleration Z	Acceleration in Z-Axis (g)
Altitude	Recorded Uncorrected Barometric Altitude (feet)
Ground Speed	Averaged derived ground speed (knots)
Heading	Magnetic Heading (degrees)
Pitch	Pitch Angle (degrees)
Bank	Bank Angle (degrees)

3.5. Plots and Corresponding Tabular Data

Figure 3 is a graphical overlay generated using Google Earth showing the entire accident flight. Weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

The device started recorded data at 19:45:49 UTC. The flight departed New Bedford Regional Airport (EWB) about 19:56 UTC and the last recorded parameter was at 20:33:01 UTC.

Figure 4 is a graphical overlay generated using Google Earth zoomed in on the end of the recording.

Figure 5 is a graphical overlay generated using Google Earth showing the last recorded data point and the main wreckage location.

Figure 6 is a plot of parameters from the Appareo Stratus 3i for the entire accident flight. The time interval is 19:40:00 to 20:35:00 UTC.

⁴Coordinated Universal Time (UTC).

Figure 7 is a plot of parameters from the Appareo Stratus 3i at the end of the accident flight. The time interval is 20:30:50 to 20:33:05 UTC.

The corresponding tabular data used to create Figures 4 through 7 are provided in electronic comma separated value (.CSV) format as Attachment 1 to this report.

Figure 3. Google Earth overlay of the entire accident flight.

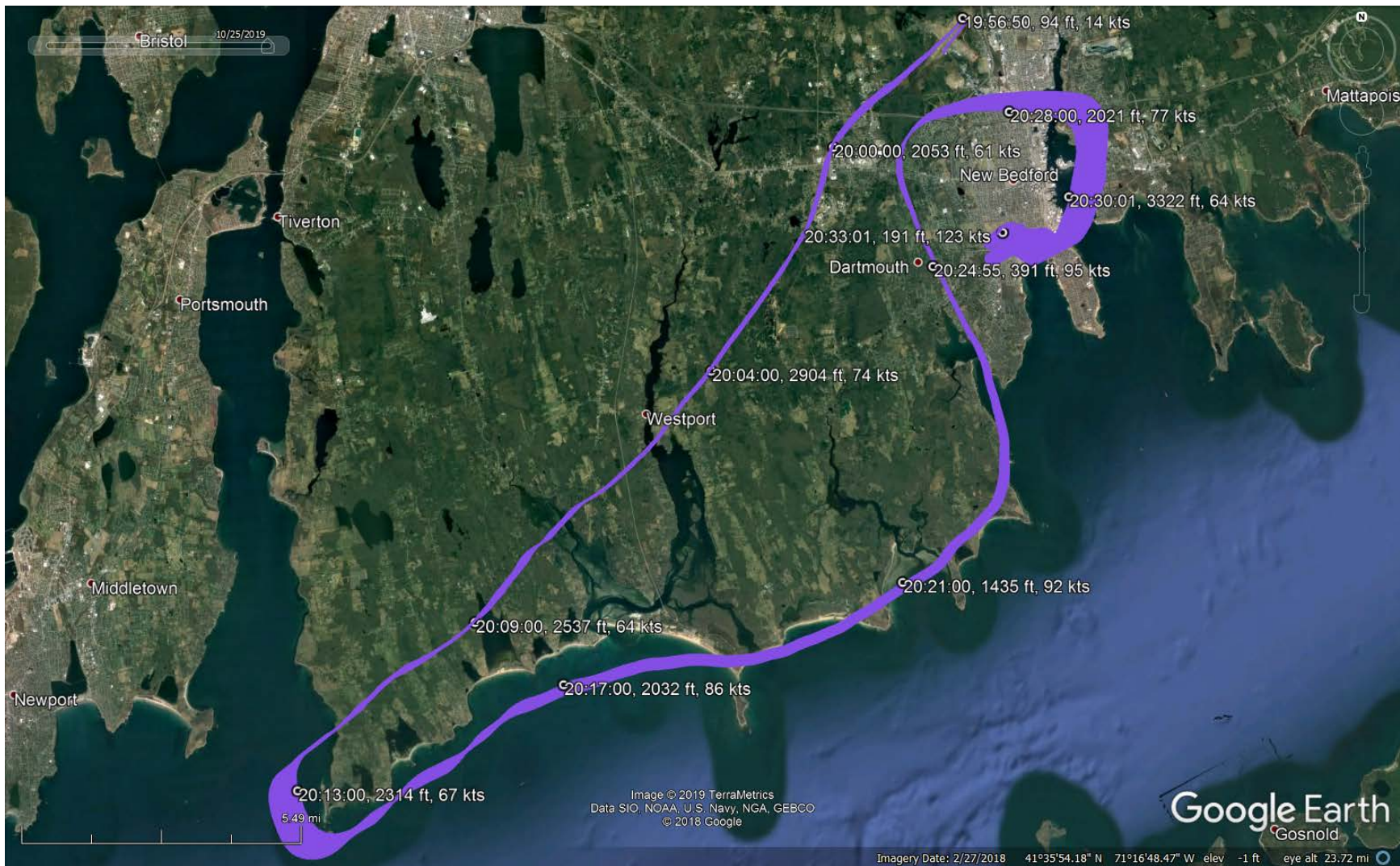


Figure 4. Google Earth overlay of the end of the accident flight.

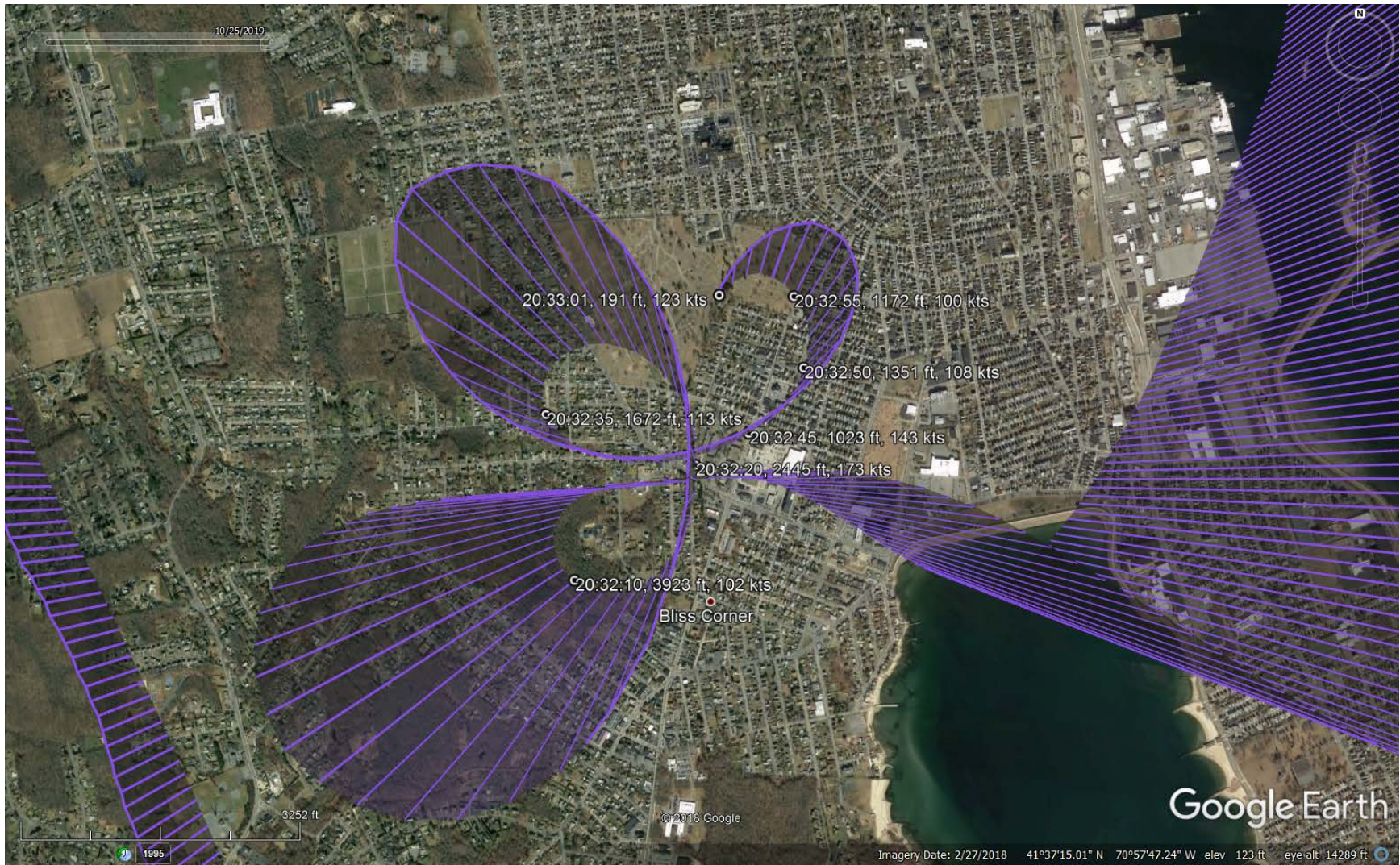


Figure 5. Google Earth overlay showing the last data point recorded and the reported wreckage location.

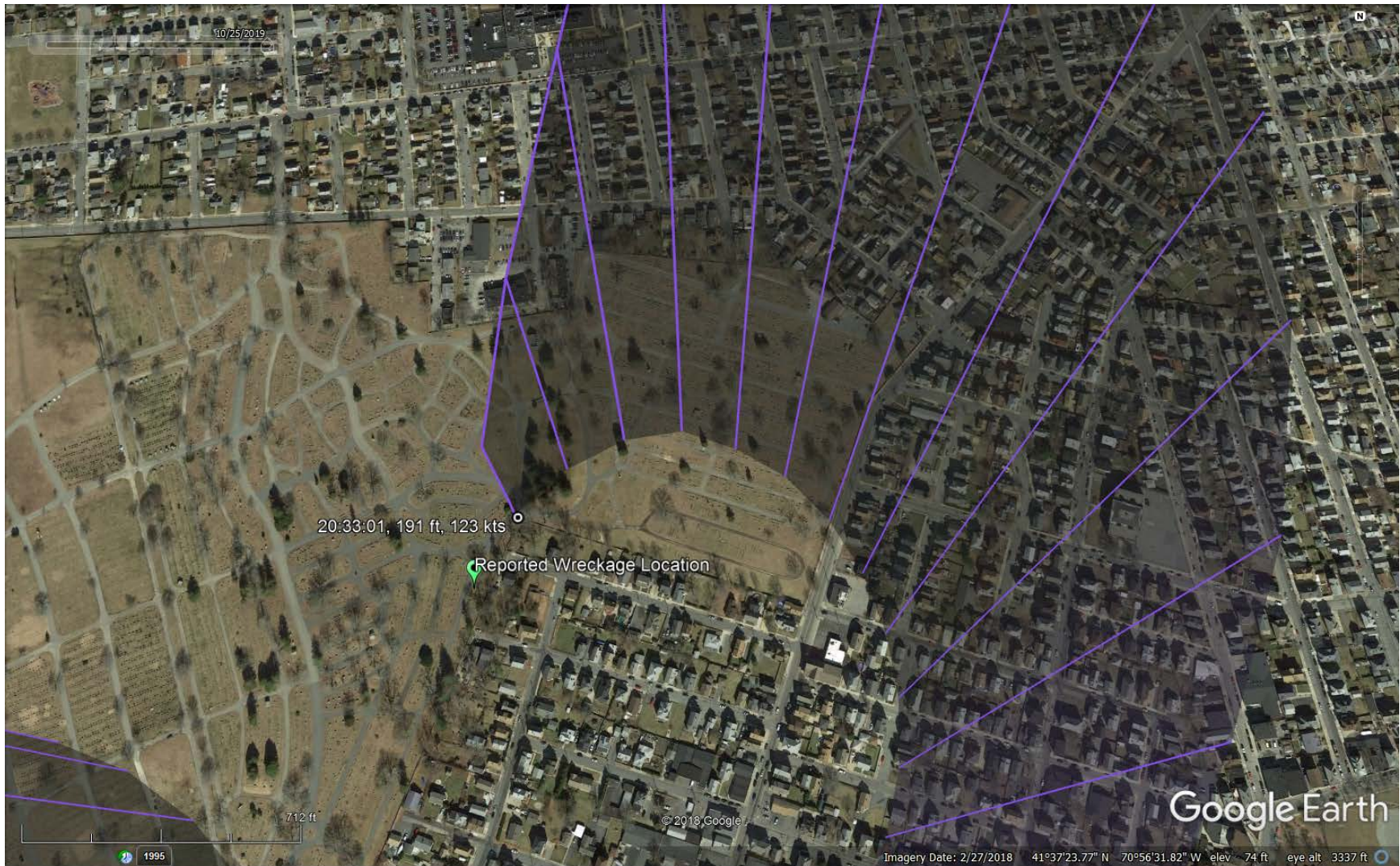


Figure 6. Plot of Stratus 3i parameters for the entire accident flight.

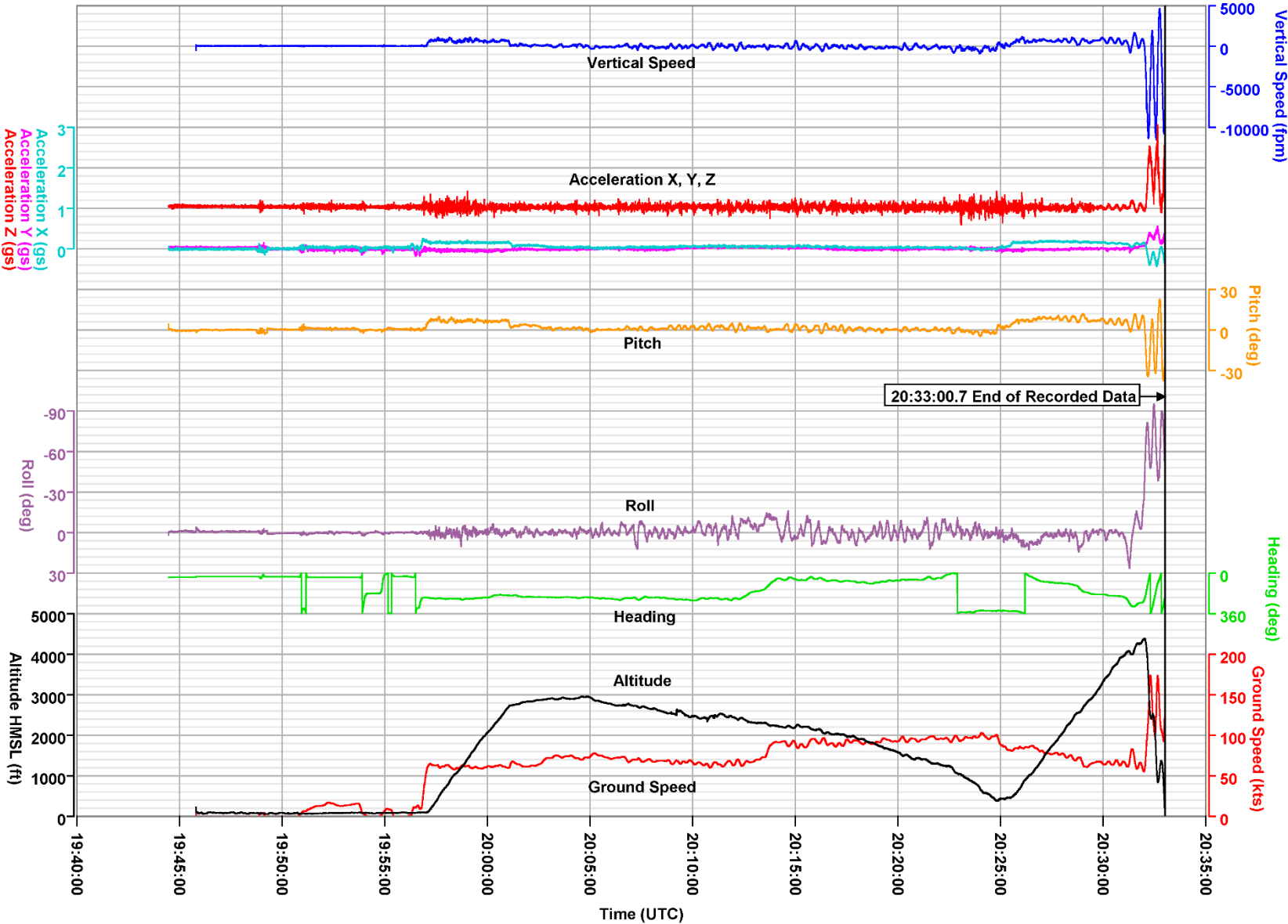


Figure 7. Plot of Stratus 3i parameters at the end of the accident flight.

