

National Transportation Safety Board

Office of Research and Engineering

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GLOBAL POSITIONING SYSTEM DEVICE

Specialist's Factual Report

February 7, 2023

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A. ACCIDENT

Location: Lind, Washington
Date: July 2, 2022
Time: About 17:33 Pacific daylight time (PDT)
Airplane: Air Tractor AT-602, N602GH

B. GLOBAL POSITIONING SYSTEM DEVICE SPECIALIST

Specialist Kyle Garner
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National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

A global positioning system (GPS) group was not convened. The NTSB Vehicle Recorder Division received the following GPS device:

Recorder Manufacturer/Model: Satloc G4
Part Number: 806-1040-000# J
Recorder Serial Number: 1444-08606-LN1-007

1.0 Device Description

The Satloc G4 is part of an onboard control system designed to programmatically control agricultural and aerial spray operations based on vendor and user-specified prescription maps. The Satloc G4 can drive a cockpit-mounted lightbar guidance system and a real-time graphic moving map display providing visual guidance to the pilot. Flow rates can be pilot selected or based on mapping created using a proprietary software package called MapStar that runs on a computer. The Satloc G4 is capable of real-time wireless transmission of position and agricultural information to a cloud-based data collection service in addition to recording similar information to an internal, eSATA solid-state disk drive.

1.1 Data Recovery

The device arrived at the laboratory undamaged. Figure 1 shows a photo of the device as received. The device was opened, and the solid-state memory was noted to be intact. The solid-state memory device was removed and read out. The memory contained several log files, including a file with the accident date in the filename. The manufacturer's software was used to convert the accident flight log to engineering units.



Figure 1. Photo of Satloc G4, as received.

1.2 Recording Description

The device contained log data from December 16, 2019, through the accident date, July 2, 2022. The data in the log file on the day of the accident started at 09:17:38 PDT and ended at 17:33:24 PDT.

1.3 Parameters Provided

Table 1 describes the parameters provided by the GPS device. Date, Time, Latitude, Longitude, and GPS Altitude are recorded by the device. Groundspeed and Track are derived from the recorded parameters.

Table 1. GPS Data Parameters.

Parameter Name	Parameter Description (units)
Alt	Recorded GPS Altitude (feet above mean sea level (MSL))
Date	Date for recorded data point (MM/DD/YYYY)
Hdg	True Course (degrees)
Lat	Recorded Latitude (degrees)
Lon	Recorded Longitude (degrees)
Speed	Average derived groundspeed (miles per hour)
Time	Time (UTC) for recorded data point (HH:MM:SS)

D. OVERLAYS AND TABULAR DATA

Figure 2 is a Google Earth overlay¹ of the accident flight path. A red and black circle denotes the last recorded data point at 17:33:24 PDT. A red pin denotes the reported location of the wreckage. The data show the aircraft made several passes in an application area, reversing course in both directions. As the aircraft was making a pass from west to east, the data ended with the aircraft on an eastward track, in a climbing trend, with the last reported GPS altitude as approximately 1331 feet. The final data point was approximately 3670 feet west of the reported wreckage location.

Figure 3 is a Google Earth overlay of the end of the accident flight path, zoomed in to show the last recorded data point and the reported location of the wreckage.

Figure 4 is a plot of altitude, groundspeed, and track data from the Satloc G4 for the entire accident flight leg from the start of the recorded data at 17:19:40 PDT to the end of the recorded data at 17:33:24 PDT.

Figure 5 is a plot of altitude, groundspeed, and track data from the Satloc G4 for the final portion of the accident flight leg from 17:32:30 PDT to the end of the recorded data at 17:33:24 PDT.

The corresponding tabular data used to create figures 2 through 5 are provided in electronic comma-separated value (CSV) format as attachment 1 to this report.

Submitted by:

Kyle Garner
Aerospace Engineer – Recorder Specialist

¹ The weather and lighting conditions in Google Earth and not necessarily representative of the conditions at the time of the accident.

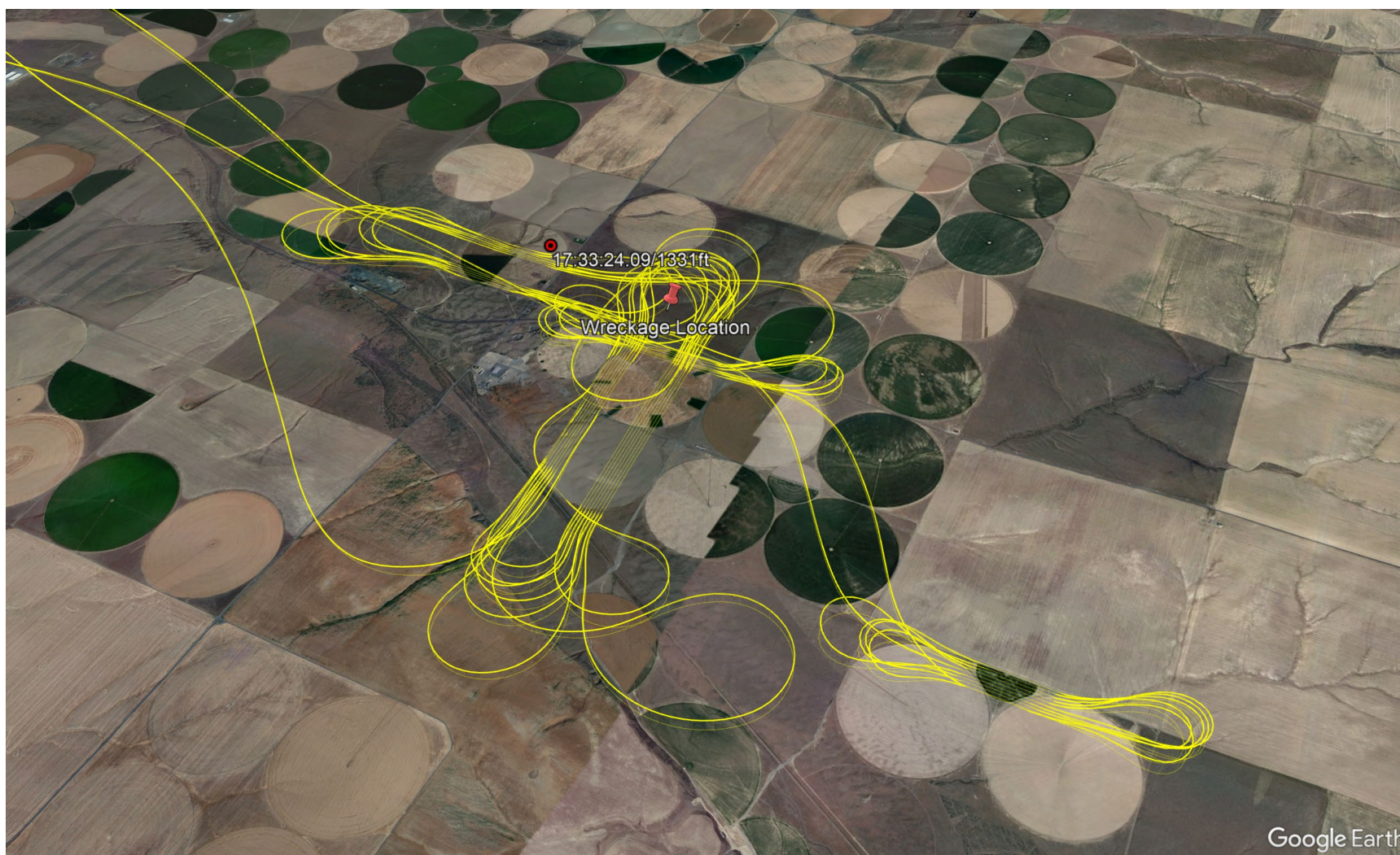


Figure 2. Google Earth overview of the accident flight. The last recorded data point and the reported wreckage location are shown for reference.

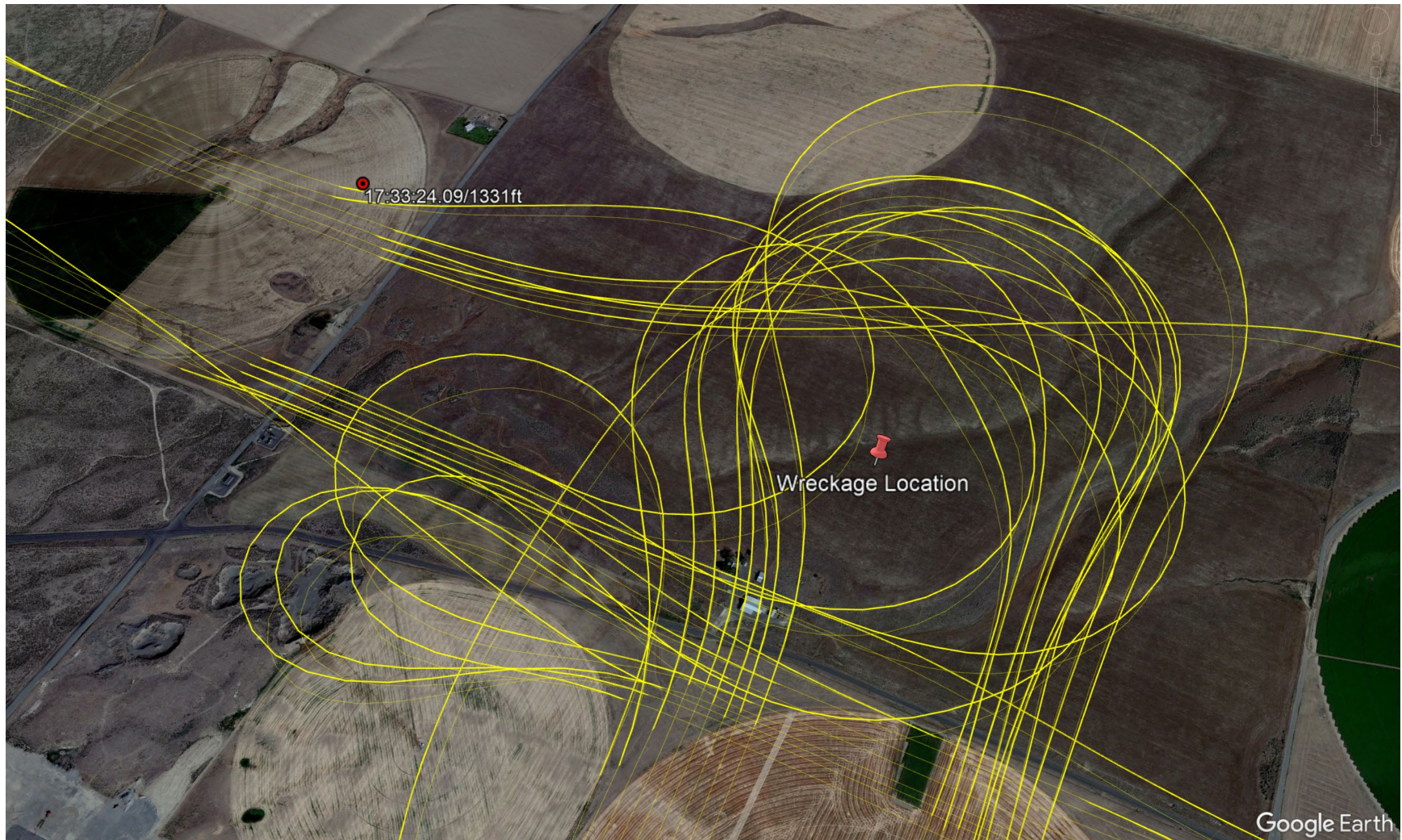


Figure 3. Google Earth overview of accident flight – zoomed to show the last recorded data point and the reported wreckage location.

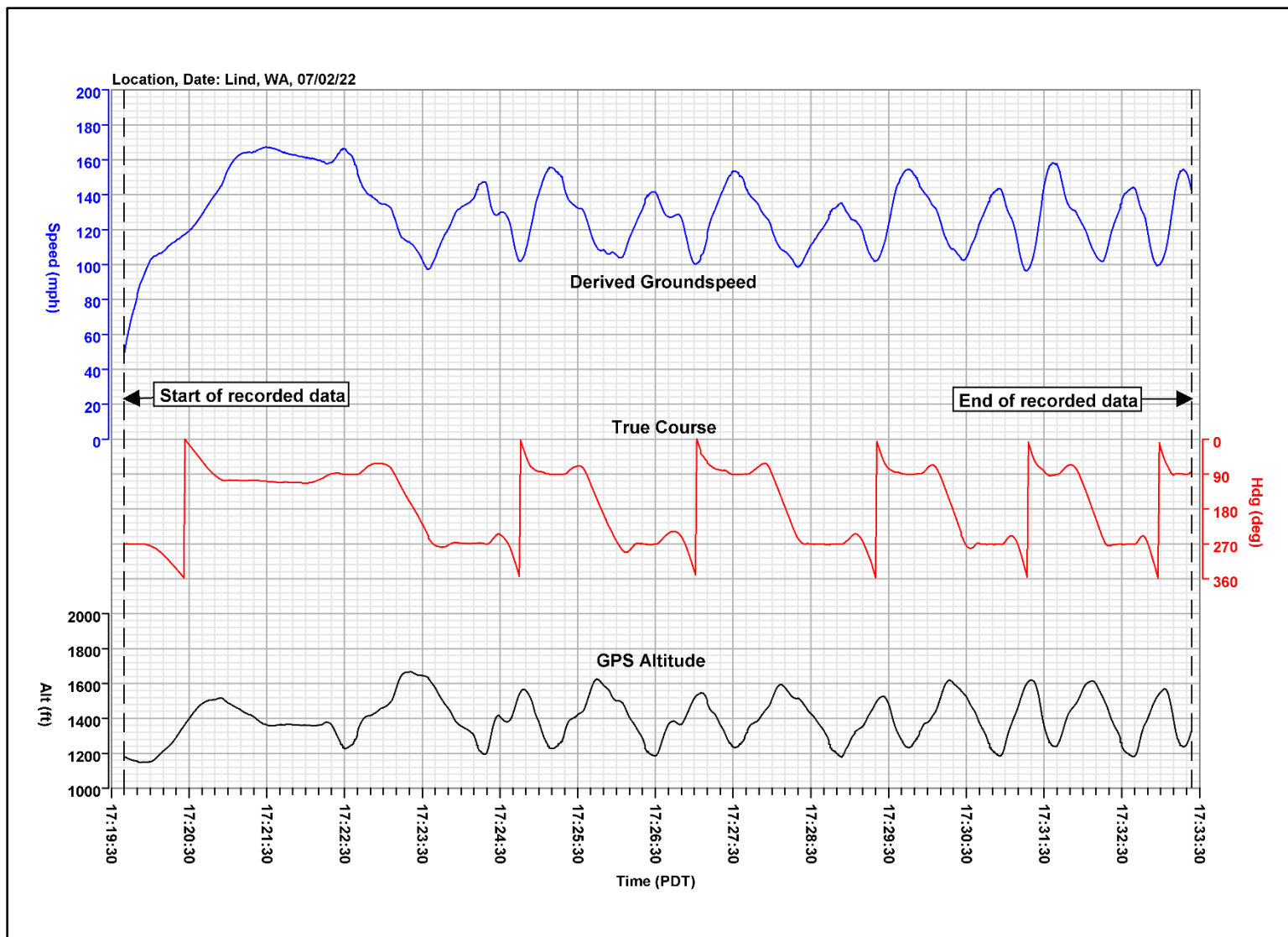


Figure 4. A plot of parameters for the entire accident flight leg.

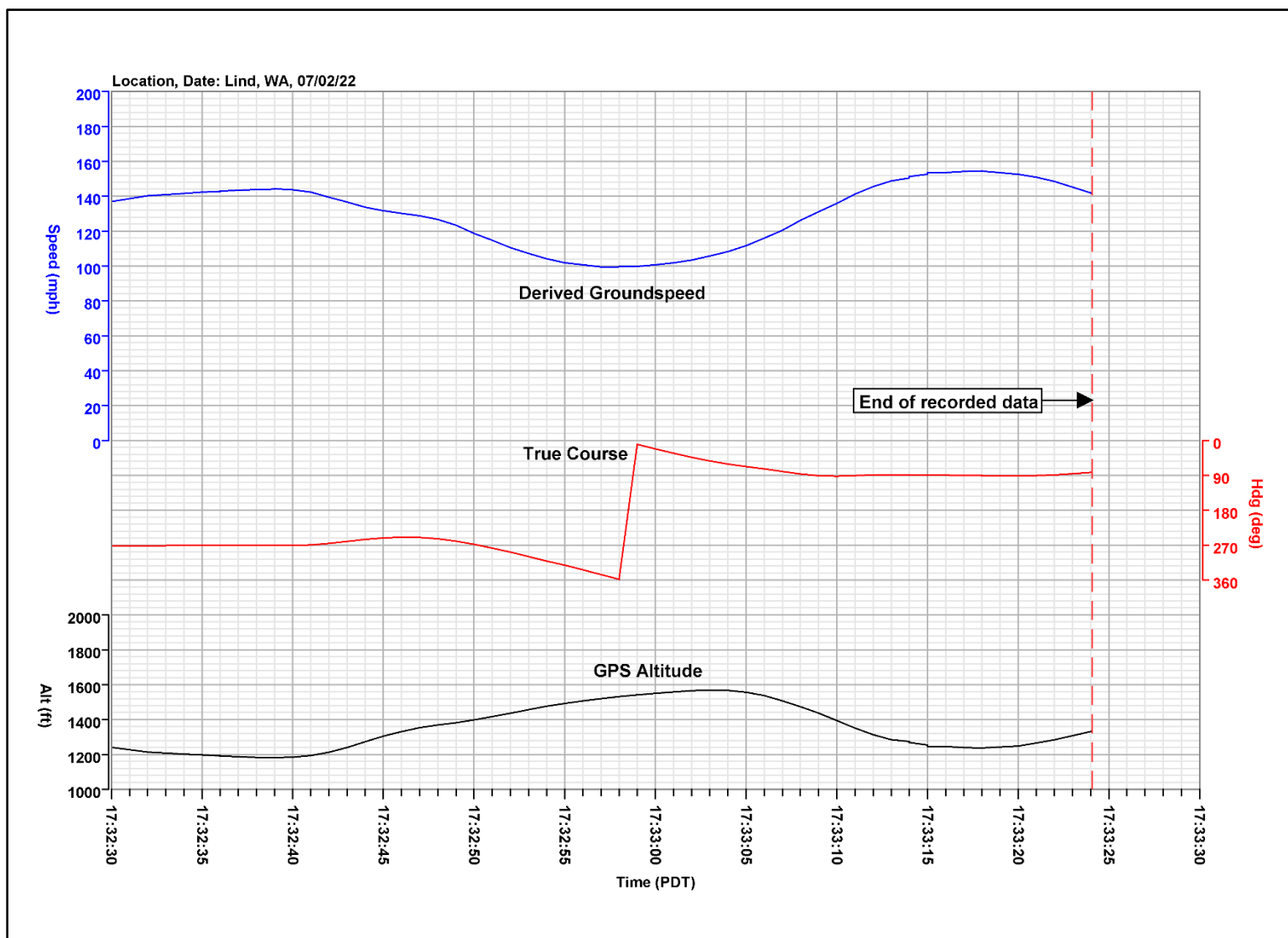


Figure 5. A plot of parameters for the final portion of the accident flight leg.