

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

July 11, 2018

Global Positioning System Device

Specialist's Factual Report
By Ben Hsu

1. EVENT

Location: Ephrata, Washington
Date: May 26, 2017
Aircraft/ID: Schleicher ASW 28-18E
Registration: N63KR
Operator: Private
NTSB Number: WPR17FA107

2. EVENT SUMMARY

On May 26, 2017, about 1523 Pacific daylight time, a Schleicher ASW 28-18E motorglider, N63KR, impacted terrain about eight miles northwest of the Ephrata Municipal Airport (EPH), Ephrata, Washington. The pilot, the sole occupant, died and the motorglider sustained substantial damage throughout. The motorglider was registered to, and operated by, the pilot as a 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed. The local flight originated from EPH at about 1420.

3. DETAILS OF DEVICE INVESTIGATION

The National Transportation Safety Board's (NTSB) Vehicle Recorder Division received the following Global Positioning System (GPS) device:

Device: PowerFLARM Portable
Device Serial Number: FLAPFP24A-001269

Figure 1 shows the condition of the device as it arrived in the laboratory. The device exhibited substantial damage due to impact forces. The device's internal memory component was removed and imaged using laboratory hardware and software. Figure 2 shows the internal components of the device. The data was decoded with technical assistance from the government of France's *Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile* (Bureau of Enquiry and Analysis for Civil Aviation Safety, or BEA).

3.1. GPS Device Description

The PowerFLARM Portable is a portable GPS device and transponder for traffic awareness and collision avoidance in General Aviation, light aircraft, and unmanned aerial vehicles. The FLARM device works by calculating and broadcasting its own future flight path to nearby aircraft also equipped with a FLARM device. The device can store a history of flight information including date/time, latitude, longitude, GPS and pressure altitudes, and groundspeed. The device stores data using internal, non-volatile¹ memory, and, if installed, a microSD memory card.

3.2. GPS Data Description

The device recorded data from the accident flight starting at 21:36:00 UTC² on May 26, 2017, and ending at 22:23:15 UTC on the same day.

3.3. Parameters Provided

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

Table 1. GPS Data Parameters

Parameter Name	Parameter Description
Time	Time (UTC) for recorded data point (HH:MM:SS)
Latitude	Recorded Latitude (degrees)
Longitude	Recorded Longitude (degrees)
GPS Altitude	Recorded GPS Altitude (meters)
Pressure Altitude	Recorded Pressure Altitude (meters)
Groundspeed	Average groundspeed between current and previous data point (knots)

4. OVERLAYS AND TABULAR DATA

Figure 3 is a graphical overlay generated using Google Earth showing an overview of the recorded session. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

Figure 4 is a graphical overlay generated using Google Earth showing the end of the recorded session.

Figure 5 is a plot of Groundspeed, GPS Altitude, and Pressure Altitude for the recorded session.

¹ Non-volatile memory is semiconductor memory that does not require external power for data retention.

² All dates and times are referenced to Coordinated Universal Time (UTC) unless otherwise specified.

Attachment 1 is the tabular data corresponding to the recorded session. The attachment is provided in electronic comma-separated value (CSV) format.



Figure 1. Photo of PowerFLARM Portable device

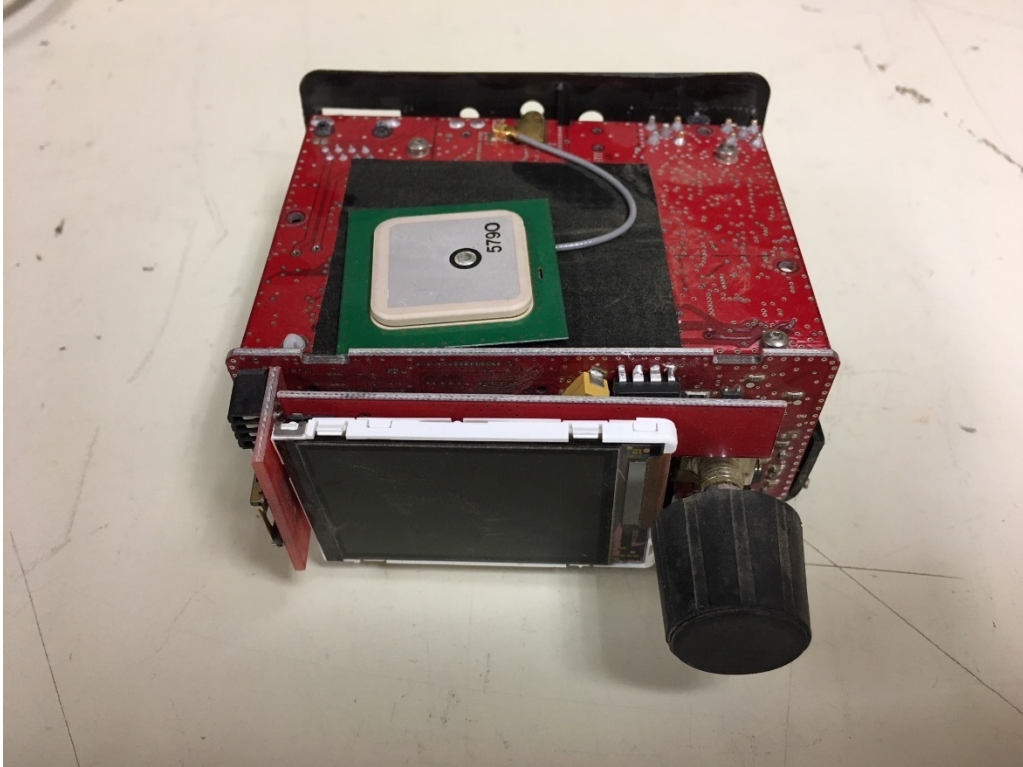


Figure 2. Photo of PowerFLARM Portable device (internal)

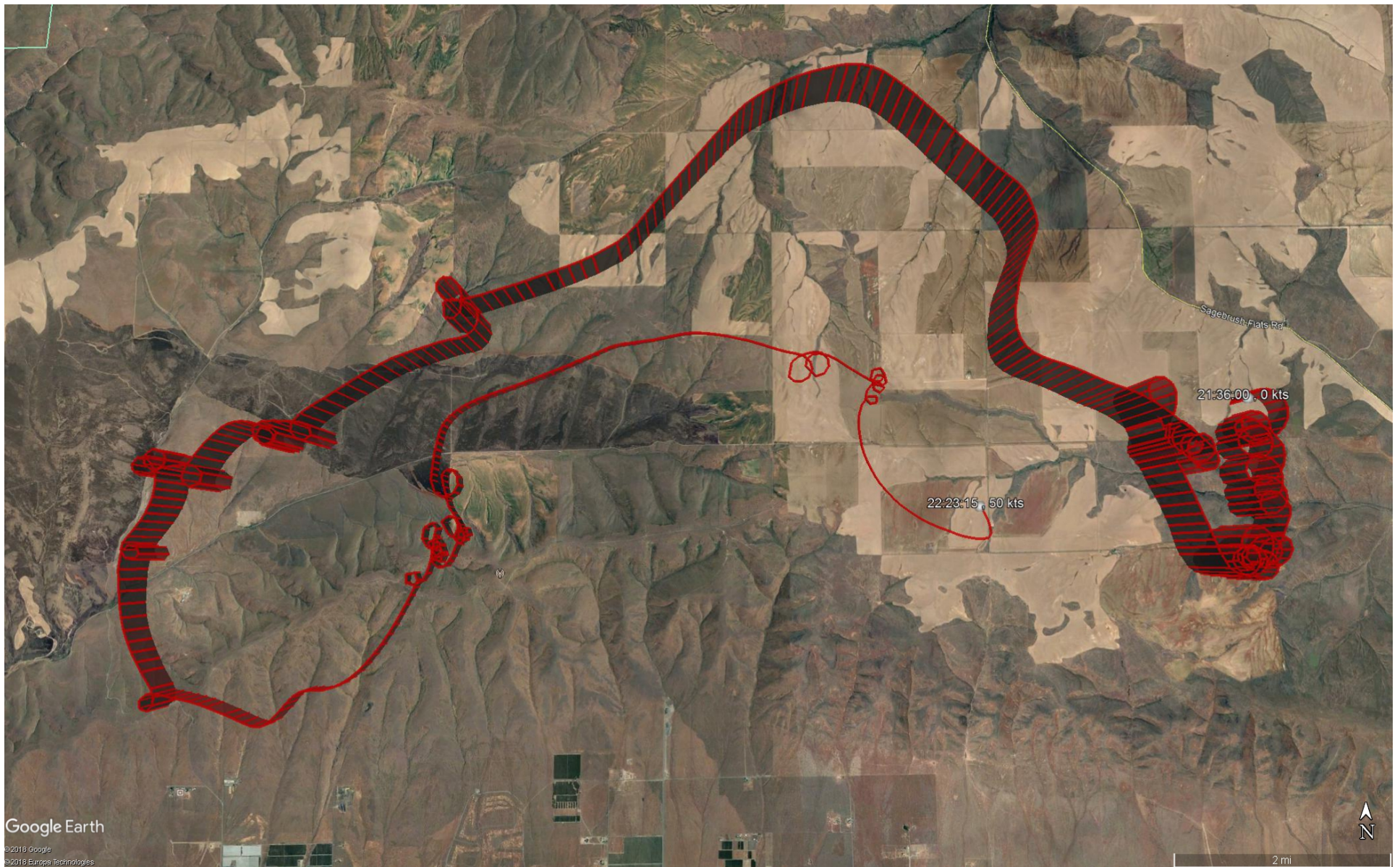
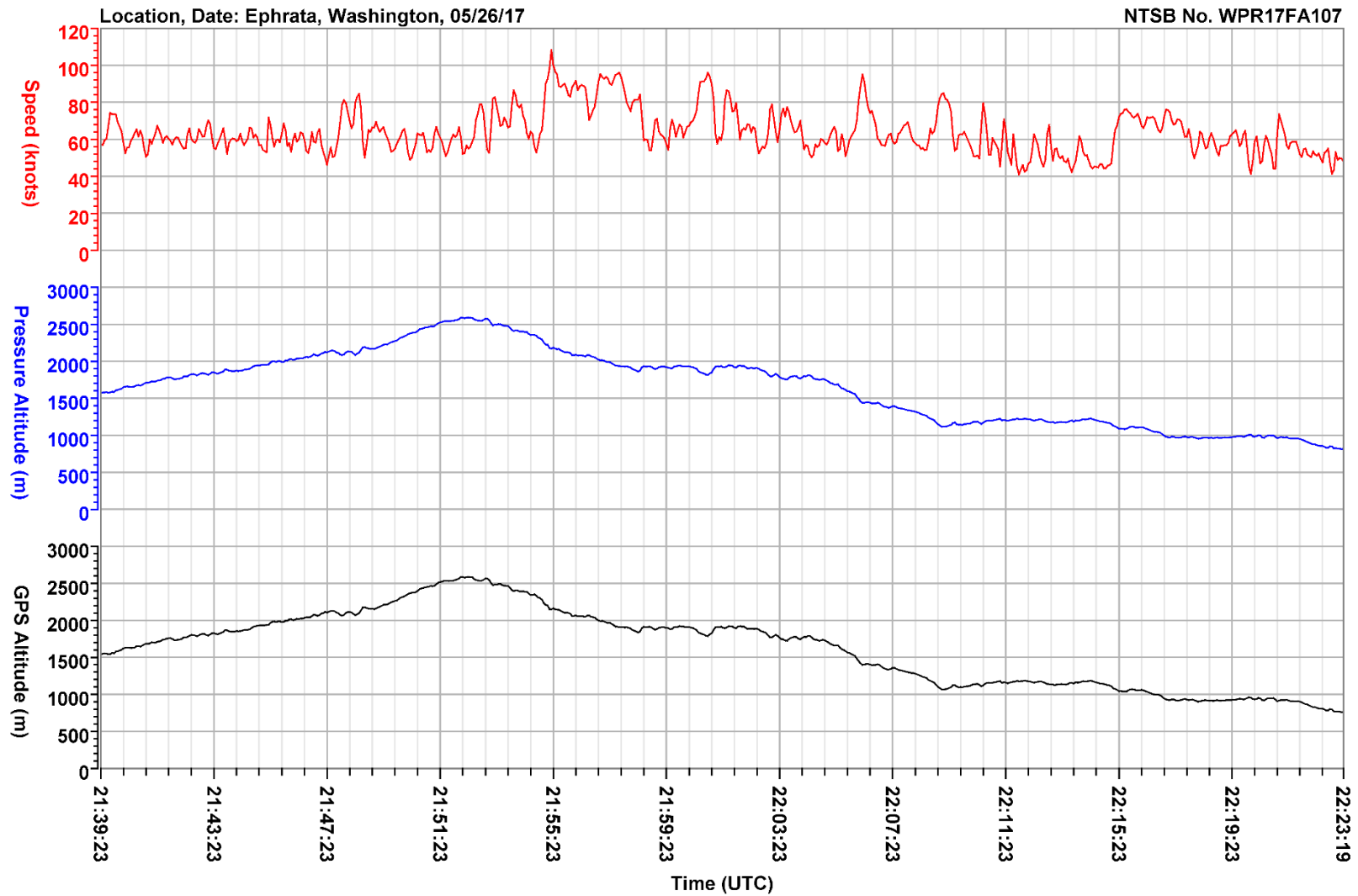


Figure 3. Overview of the recorded session on May 26, 2017



Figure 4. Detail view of the end of the recorded session

Private, Schleicher ASW-28, N63KR



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Figure 5. Plot of altitude and groundspeed data