

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

September 29, 2021

Recorded Flight Data

Specialist's Factual Report
By Gerald Kawamoto

1. EVENT SUMMARY

Location: Seiling, Oklahoma
Date: July 12, 2021
Aircraft: PZL Mielec M-18A
Registration: N9310R
Operator: Private
NTSB Number: CEN21FA314

2. RECORDED FLIGHT DATA GROUP

A recorded flight data group was not convened.

3. DETAILS OF INVESTIGATION

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

Recorder Manufacturer/Model: **SATLOC G4**
Recorder Serial Number: **1505-09171-LN1-040**

3.1. SATLOC G4 Description

SATLOC devices are part of an on-board control system designed to programmatically control agricultural, aerial spray operations based on vendor and user specified prescription maps. SATLOCs 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 desktop computer. SATLOCs are capable of recording historical information in a Windows-based operating system format to non-volatile memory (NVM).¹ In the case of the G4, to an internal SATA drive.

3.1.1. SATLOC G4 Data Recovery

The recorder was in good condition upon arrival at the Vehicle Recorder Laboratory, as shown in Figure 1. Data were extracted from the internal SATA drive using laboratory tools.

¹ Non-volatile memory – semi-conductor memory that does not need power applied to retain data.



Figure 1. SATLOC G-4 as received.

3.1.2. SATLOC G4 Data Description

Data included log files recorded from March 3, 2020, through July 12, 2021, Central Daylight Time (CDT). The last recorded log started at 7:44:45.4 and ended at 8:05:42.2 CDT. Table 1 shows basic parameters recorded by the device.

Table 1. SATLOC Parameters.

Parameter Name	Parameter Description (parameter units)
Date	Date for recorded data point (MM/DD/YYYY)
Time	Time (CST) for recorded data point (HH:MM:SS.00)
Latitude (deg)	Recorded Latitude (degrees)
Longitude (deg)	Recorded Longitude (degrees)
Alt (ft)	Recorded GPS Altitude (feet)
Gndspd (kts)	Derived Ground Speed (knots)
Hdg (deg)	Derived True Course (degrees)

3.2. Plots and Corresponding Tabular Data

The following three figures contain data recorded during the July 12, 2021, event.

Figure 2 is a Google Earth overlay of the accident flight. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the accident flight.

Figure 3 is a Google Earth overlay of the end of the accident flight. The wreckage location is depicted with a red pin. The calculated distance between the wreckage location and the last recorded GPS data point was 0.38 statute miles (0.33 nautical miles). The ground speed associated with the last data point was 114 knots. Data is buffered in volatile memory and written to the internal non-volatile data drive. According to the manufacturer, the length of the buffer varies depending on the internal processor workload but can be on the order of 10-20 seconds, or longer. Data stored in the buffer and not written to the data drive is permanently lost when power is interrupted to the SATLOC G4. Due to the buffer, the recording may have ended before the accident event.

Figure 4 is a plot of basic parameters recorded by the SATLOC G4.

The corresponding tabular data used to create these three plots are provided in electronic (*.csv²) format as Attachment 1 to this report.

² Comma Separated Value format.

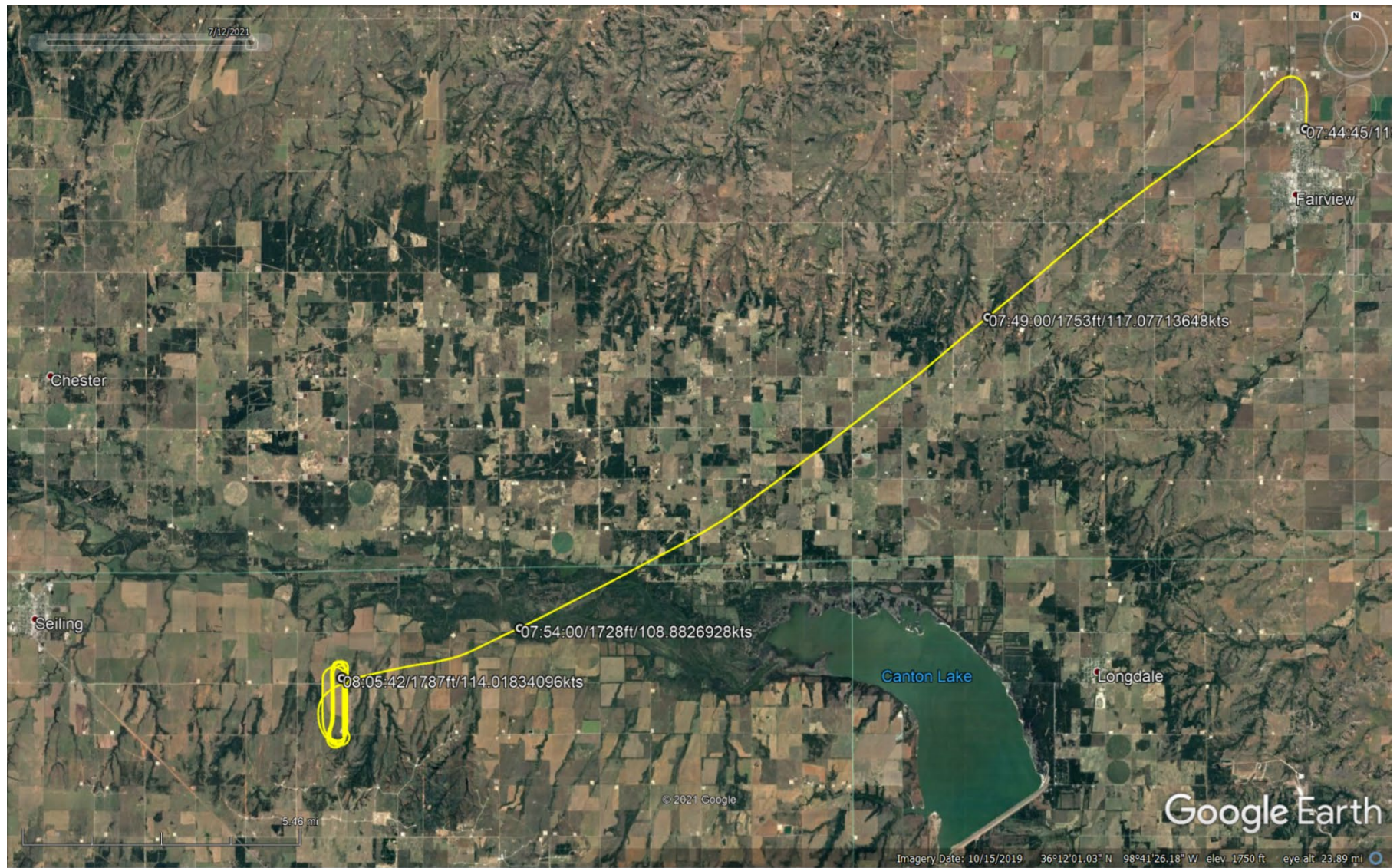


Figure 2. Google Earth overlay of the accident flight.

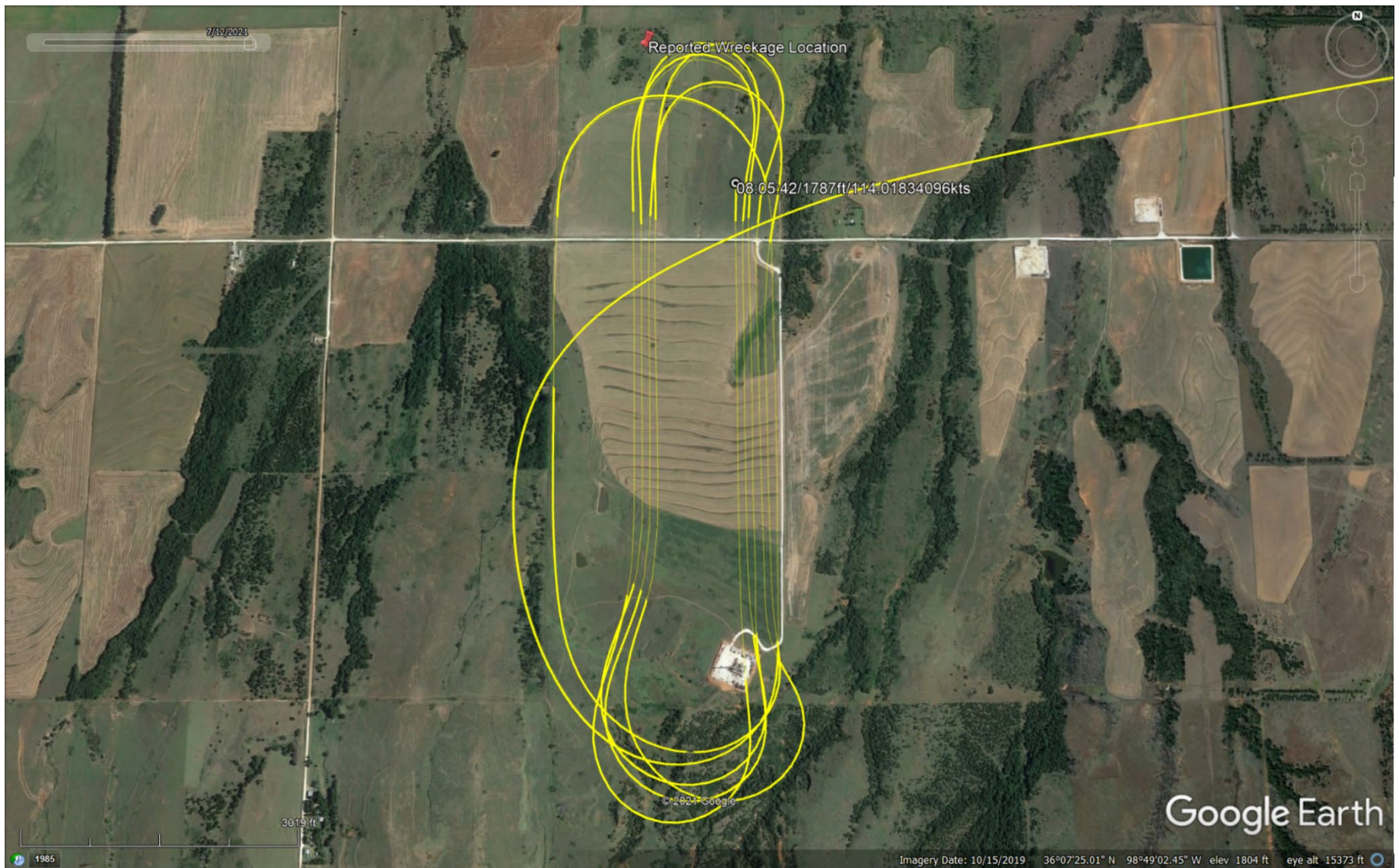


Figure 3. Google Earth overlay of the end of the accident flight and reported wreckage location.

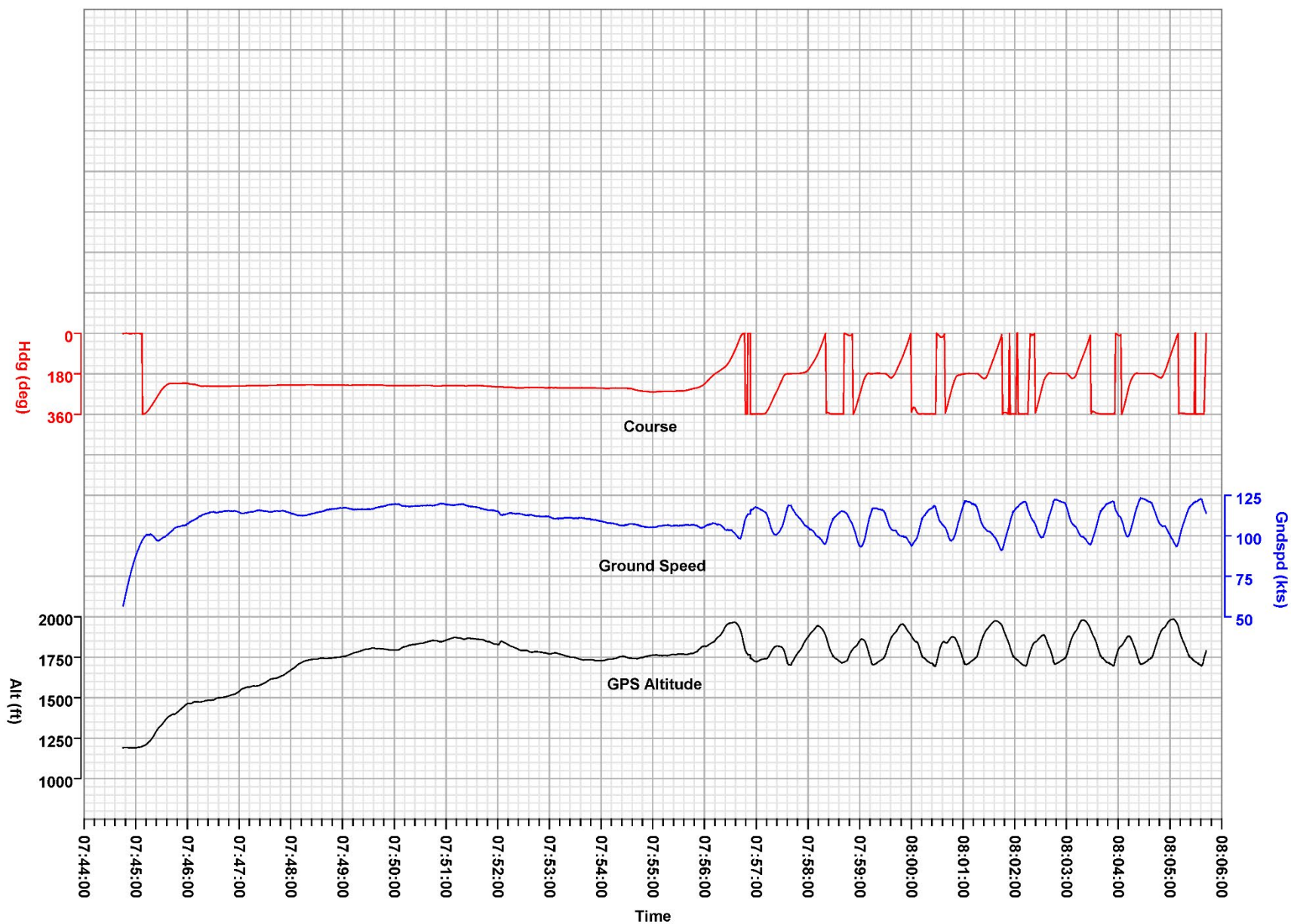


Figure 4. Plot of basic parameters recorded on the SATLOC G4.