

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ERA23LA293

GLOBAL POSITIONING SYSTEM DEVICE

Specialist's Factual Report

October 18, 2023

A. ACCIDENT

Location: Waldorf, Maryland
Date: July 9, 2023
Time: 1027 eastern daylight time (EDT)
1427 coordinated universal time (UTC)
Helicopter: Hughes 369D, Haverfield International Inc, N5027P

B. GLOBAL POSITIONING SYSTEM DEVICE SPECIALIST

Specialist: Steven Smith
Mechanical Engineer (Recorder Specialist)
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: Garmin GPSMAP 696
Recorder Serial Number: 3AJ002655

1.0 Garmin GPS MAP 696 - Device Description

The Garmin GPSMAP 696 is a portable GPS receiver capable of storing date, route-of-flight, and flight-time information for up to 50 flights. A detailed tracklog, including latitude, longitude, altitude, date, time, and groundspeed information, is stored within the unit whenever the receiver has a lock on the GPS navigation signal. All recorded data is stored in non-volatile memory. The unit contains hardware and software permitting the download of recorded waypoint, route, and tracklog information to a PC via a built-in serial port. The unit can also communicate with external devices such as a computer using a built in USB port. An internal button-battery is used to back-up power to the internal memory and real-time clock during those periods when main power is removed.

1.1 Garmin GPSMAP 696 - Condition and Data Recovery

The Garmin GPSMAP 696 was in good condition upon arrival at the Vehicle Recorder Division, as shown in figure 1. The device powered on normally and the data were downloaded normally using the manufacturer's procedure. Figure 2 shows numerous flight logs recorded on the device.



Figure 1. Garmin GPSMAP 696 as received by the Vehicle Recorders Division.



Figure 2. Flight Log of the Garmin GPSMAP 696.

1.2 Garmin GPSMAP 696 - Recording Description

The data extracted included 50 sessions from May 24, 2023, through July 9, 2023.¹ The accident flight was recorded starting 12:13:31 UTC and ending 14:27:02 UTC on July 9, 2023.

1.3 Garmin GPSMAP 696 - Time Correlation

Correlation of the Garmin GPSMAP 696 data from UTC to the event local time, EDT, was established by applying an additional 4 hour offset to change UTC to EDT. Therefore, for the rest of this report, all times are referenced as EDT, not UTC.

1.4 Garmin GPSMAP 696 - Parameters Provided

Table 1 describes data 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 (units)	Parameter Description (units)
Date	Date for recorded data point (MM/DD/YYYY)
Time	Time (UTC) for recorded data point (HH:MM:SS)
Latitude (deg)	Recorded Latitude (degrees)
Longitude (deg)	Recorded Longitude (degrees)
GPS Alt (ft)	Recorded GPS Altitude (feet)
Groundspeed (kts)	Average derived groundspeed (knots)
Track (deg)	Average derived true course (degrees)

D. OVERLAYS AND TABULAR DATA

Data obtained from the Garmin GPSMAP 696 was used to produce the following overlays and tabular data. Figures 3 and 4 is a graphical overlay generated using Google Earth for the entire flight and the approximate final minute before the accident, respectively. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

The device began the accident flight recording at approximately 08:13:31 EDT. The last recording was as at 10:27:02 EDT on July 9, 2023, with a GPS altitude of 207 feet above Mean Sea Level (MSL) and a ground speed of 0 knots. Due to data

¹ All dates and times are referenced to coordinated universal time (UTC).

buffering on the GPS unit, the data recording may have ended before the accident event.

The corresponding tabular data used to create figures 3 and 4, including UTC Hours, UTC Minutes, UTC Seconds, Latitude, and Longitude, are provided in electronic comma separated value (CSV) format as attachment 1 to this report.

Submitted by:

Steven Smith
Mechanical Engineer (Recorder Specialist)

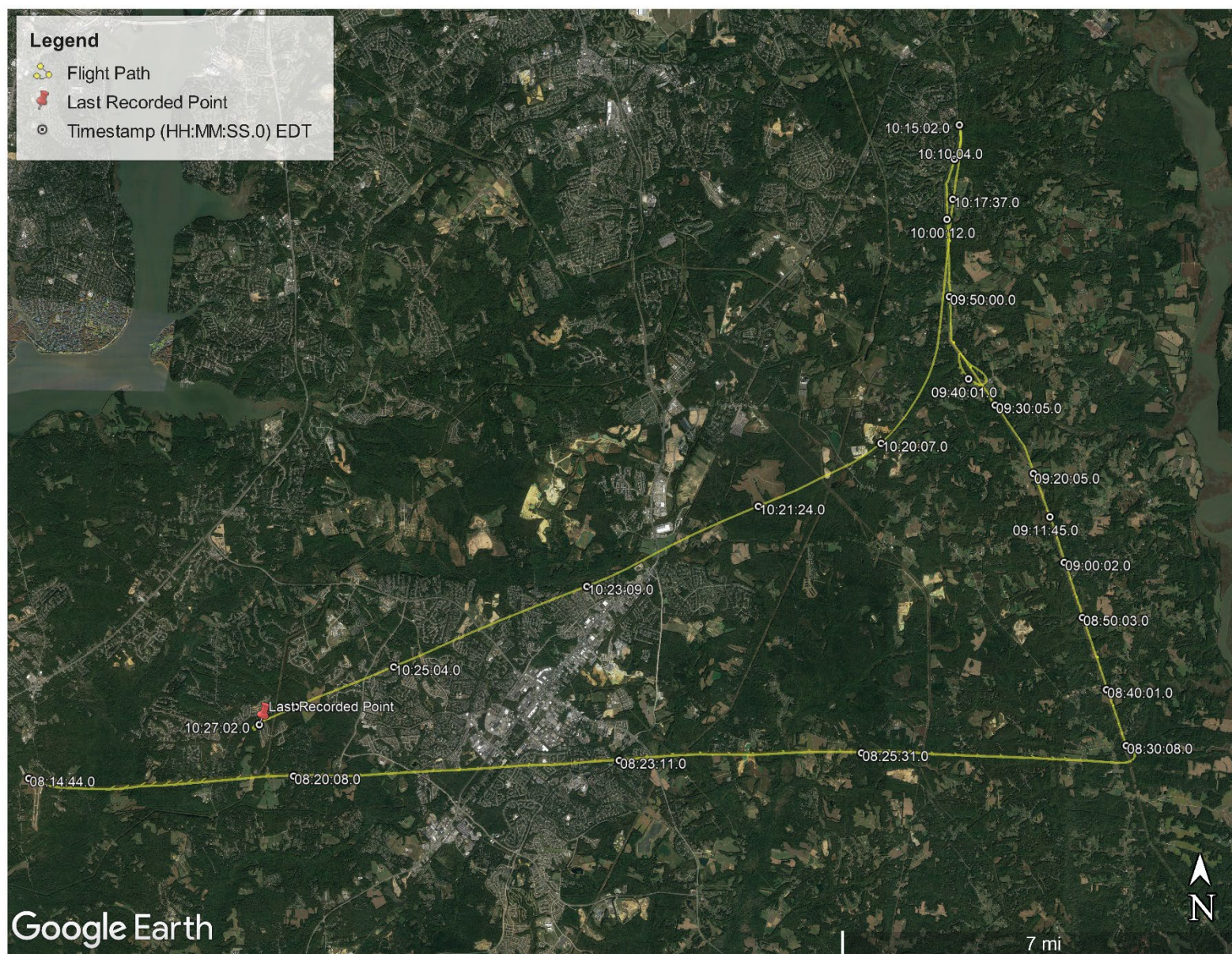


Figure 3. Google Earth overlay of the entire flight.

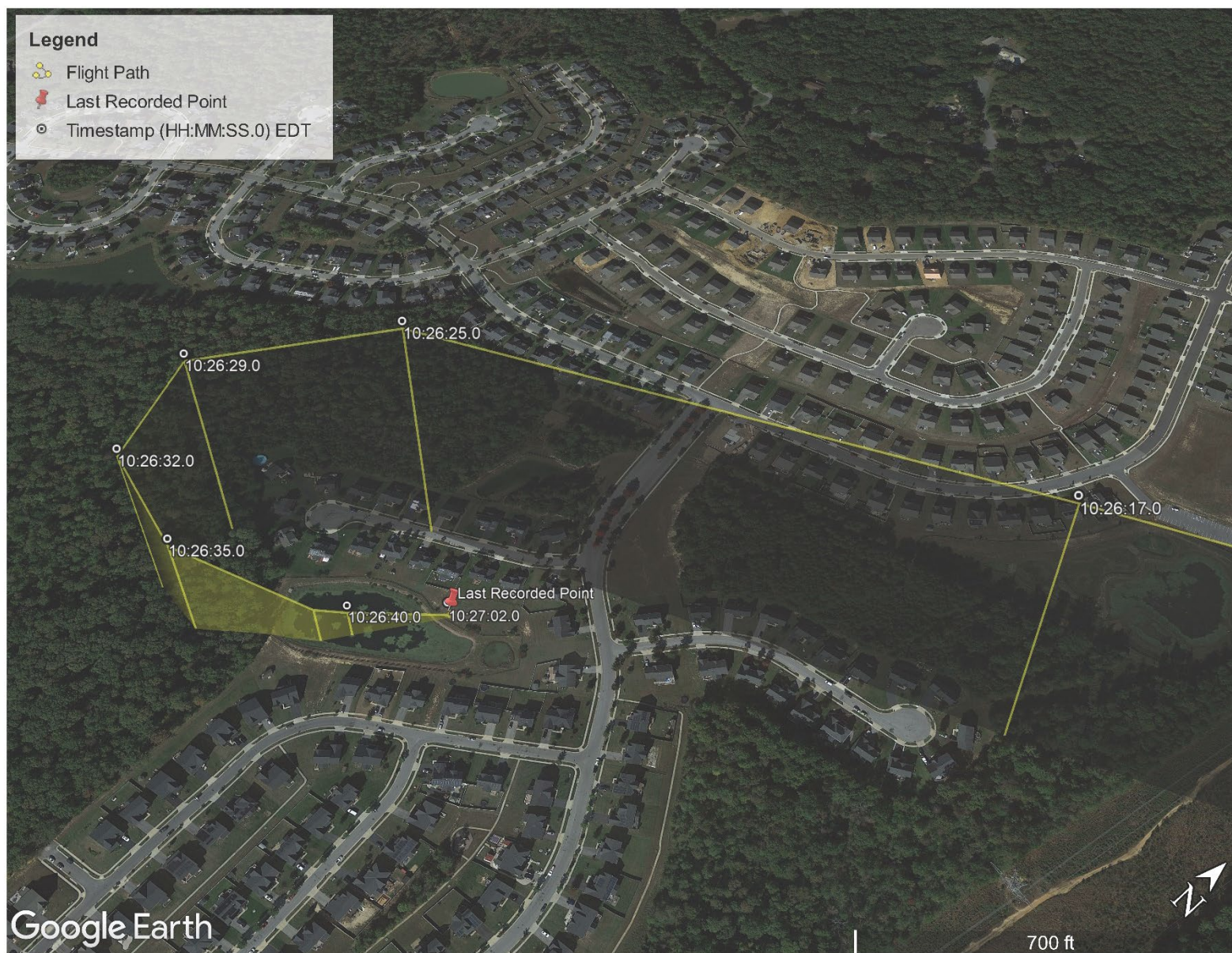


Figure 4. Google Earth overlay of the last approximate minute before the accident.