

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ANC24FA092

GLOBAL POSITIONING SYSTEM (GPS) DEVICE

Specialist's Factual Report

January 13, 2026

A. ACCIDENT SUMMARY

Location: Wasilla, Alaska
Date: September 14, 2024
Time: 0934 Alaska Daylight Time (ADT)
Airplane: Experimental amateur-built JP Flyer, N1202Y

B. GLOBAL POSITIONING SYSTEM (GPS) DEVICE SPECIALIST

Specialist: W. Deven Chen
Electrical Engineer – Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

A recorder group was not convened. The NTSB Vehicle Recorder Division received the following GPS device:

Recorder Manufacturer/Model:	Garmin GPSMAP 196
Recorder Serial Number:	Unknown due to damage

1.0 Device Description

The Garmin GPSMAP 196 is a portable GPS unit equipped with a detachable antenna, and a 320 x 240 12-level grayscale LCD display. The unit is equipped with a built-in base map and internal Jeppesen aviation database. The unit employs a parallel 12 channel Wide Area Augmentation System (WAAS)-capable receiver and can be operated using external power, or alternatively by four standard AA-size batteries. The GPSMAP 196 can store date, route of flight, and flight time information for up to 50 individual flights in the form of a flight log. Flight logging begins when the GPS unit senses a speed increase to greater than 30 knots together with an altitude gain of greater than 500 feet. Recorded flight log data is saved when the speed is sensed to decrease to below 30 knots, and a new log is started if more than 10 minutes passes from this time. A detailed track log – including latitude, longitude, date, time, and GPS altitude information for an unspecified number of points – is stored within the unit whenever the receiver has a lock on the GPS navigation signal. Track log position is updated as a function of time or distance moved, depending on how the unit has been configured. Once the current track log memory becomes full, new information either overwrites the oldest information or recording stops, depending on how the unit is configured. The current track log can be saved to long-term memory and 15 saved track logs can be maintained in addition to the current track log. Track log storage may be activated or de-activated at user discretion. All

recorded data is stored in non-volatile¹ (NVM) memory. The unit contains hardware and software permitting the download of recorded waypoint, route, and track log information to a PC via a built-in serial port using the NMEA 0183 version 2.0 protocol. 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 Device Condition and Data Recovery

The Garmin GPSMAP 196 sustained severe fire damage during the accident event, rendering it inoperable, as shown in Figure 1. The internal circuit board was removed, which presented damage as well. A chip-level data recovery was performed, where the memory chip was removed, read out, and converted into engineering unit data using laboratory tools.



Figure 1. The front and back of the Garmin GPSMAP 196 as received.

1.2 Recording Description

The recovered data contained 21 sessions, from July 2, 2023, to September 14, 2024. The accident flight was the last session recorded. The duration of this recording was approximately 8 minutes and 35 seconds, from 17:25:51 to 17:34:26 UTC. The recording rate ranged from 4 to 44 seconds per sample.

1.2.1 Parameters Provided

Table 1 lists the recorder parameters verified and provided in this report.

Table 1. Garmin GPSMAP 196 data parameters provided.

Parameter Name (unit)	Parameter Description
GPS Alt (Ft)	Geometric altitude above mean sea level (feet)
Groundspeed (Kt)	Average groundspeed between current and previous data point (knots)

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

Parameter Name (unit)	Parameter Description
Latitude (Deg)	Geographic latitude (degrees)
Longitude (Deg)	Geographic longitude (degrees)
Track (Deg)	Path on the surface of the Earth directly below aircraft (degrees)

1.3 Time Correlation

The data was recorded in coordinated universal time (UTC) and was kept in UTC for this report.

D. FIGURES AND TABULAR DATA

Figure 2 to figure 4 contain data downloaded from the Garmin GPSMAP 196.

Figure 2 is a data parameter plot of the entire accident session. The time shown is 17:25:50 to 17:34:30 UTC.

Figure 3 and figure 4 are Google Earth overlays of the accident session. Figure 3 shows the entire accident session, and figure 4 shows the final portion of the accident session.

The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

The corresponding tabular data used to create figures 2 to 4 are provided as attachment 1 in electronic comma-separated value (CSV) format to this report.

Submitted by:

W. Deven Chen
Electrical Engineer - Recorder Specialist

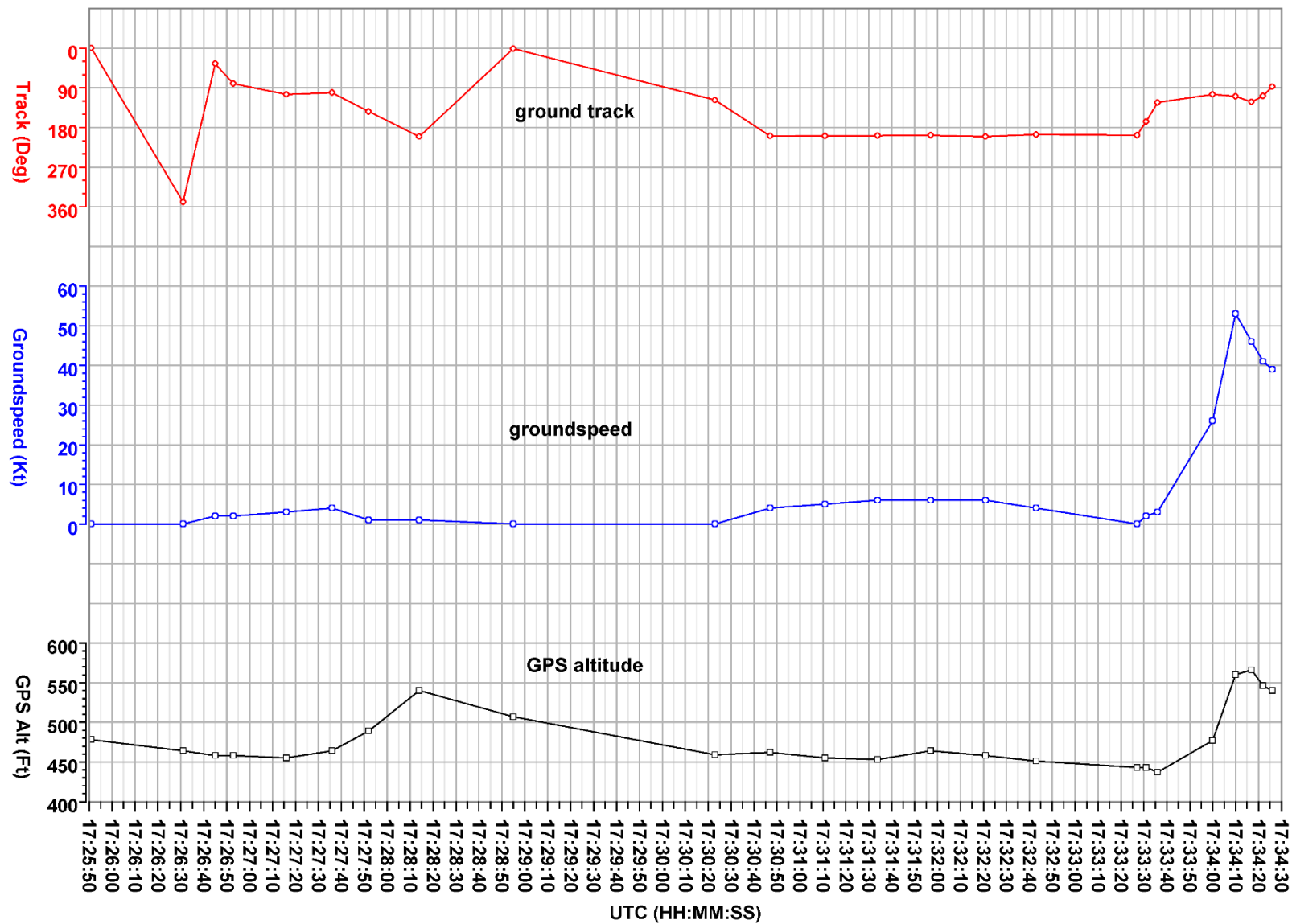


Figure 2. Plot of data parameters of the entire accident session recording.

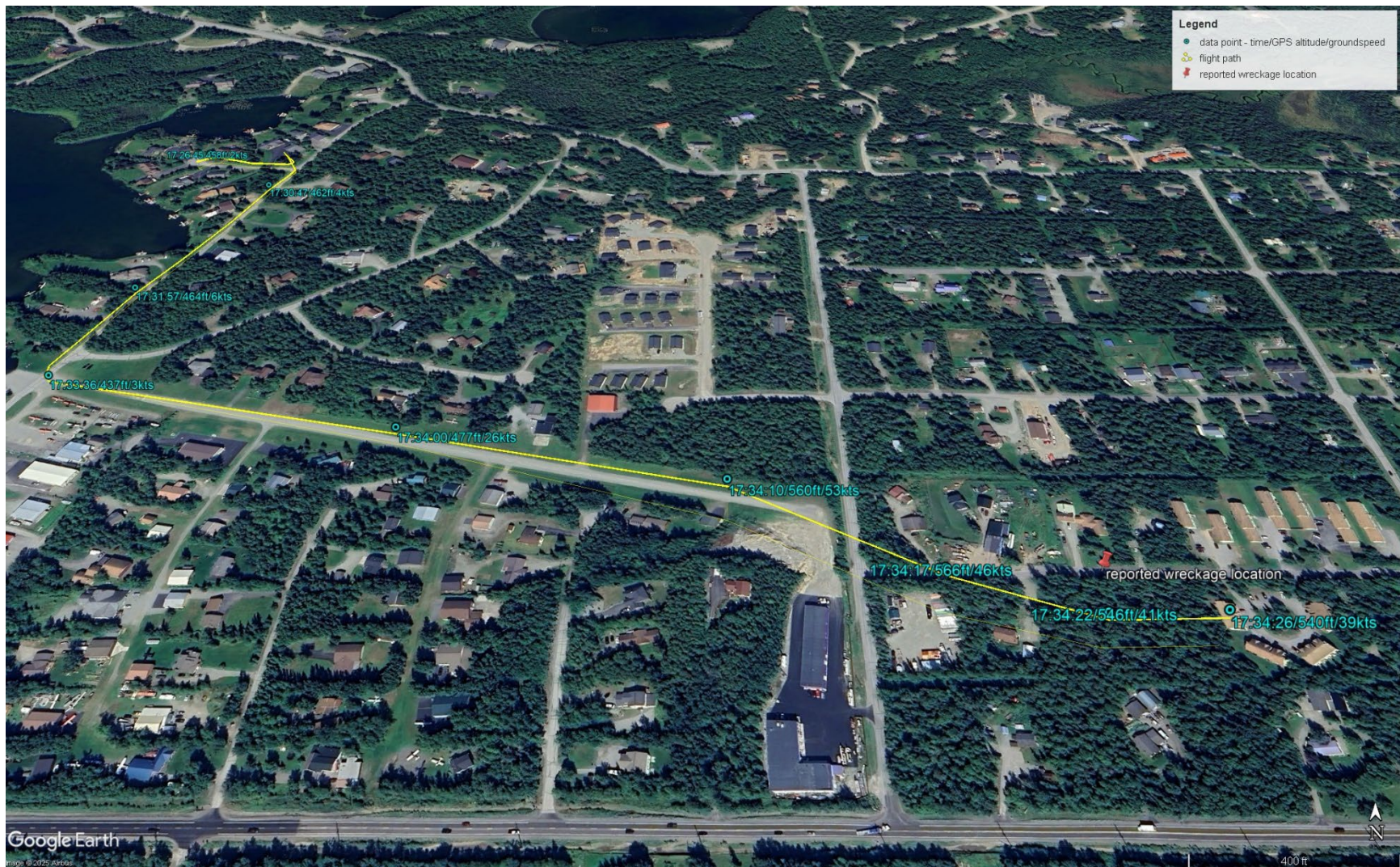


Figure 3. Google Earth overlay of the entire accident session on September 14, 2024.



Figure 4. Google Earth overlay of the final portion of the accident session.