

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

April 25, 2019

Global Positioning System Device

Specialist's Factual Report
By Gerald Kawamoto

1. EVENT SUMMARY

Location: Elko, Nevada
Date: January 11, 2018
Aircraft: Piper PA-23-250
Registration: N54857
Operator: Private
NTSB Number: WPR18FA073

On January 11, 2018, about 1800 Pacific standard time, a Piper PA-23-250, twin engine airplane, N54857, collided with mountainous terrain about 42 miles south of Elko, Nevada. The commercial pilot was the sole person on board and was fatally injured. The airplane sustained substantial damage. The airplane was registered to Mach Tuck, LLC, and operated by Air America Flight Center, LLC., under the provisions of 14 *Code of Federal Regulations* Part 91 as a cross-country positioning flight. Visual meteorological conditions prevailed for the flight, and a VFR flight plan was filed. The flight departed about 1500 from McClellan Airfield (MCC), Sacramento, California and had a destination of Salt Lake City International Airport (SLC), Salt Lake City, Utah.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following global positioning system (GPS) device:

Device Manufacturer/Model:	Garmin GPSMAP 496
Serial Number:	19708675

3.1. Device Description

The Garmin GPSMAP 496 is a battery-powered portable 12-channel GPS receiver with a 256-color thin-film transistor (TFT) liquid-crystal display (LCD) display screen. The unit includes a built-in Jeppesen database and is capable of receiving XM satellite radio for

flight information including NEXRAD radar, lightning, METARs, TAFs, and TFRs. A built-in AOPA Airport Directory and SafeTaxi Airport Diagrams are included for selected fields. The unit stores date, route-of-flight, and flight-time information for up to 50 flights. A flight record is triggered when groundspeed exceeds 30 knots and altitude exceeds 250 feet, and ends when groundspeed drops below 30 knots for 10 minutes or more. A detailed tracklog, 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. Position is updated within the tracklog as a function of time or distance moved, depending on how the unit has been configured. Once the current tracklog memory becomes full, new information either overwrites the oldest information or recording stops, depending on how the unit is configured. The current tracklog can be saved to long-term memory and 15 saved tracklogs can be maintained in addition to the current tracklog. Tracklog storage may be activated or deactivated at user discretion. 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. 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.

3.2. Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit has sustained impact damage, as shown in Figure 1, resulting in the unit becoming inoperable. The non-volatile memory chip was removed and data was downloaded and converted to engineering units using laboratory equipment.

Figure 1. Front and back of the Garmin device as received.



3.3. Data Description

The data extracted included 5 tracklogs from January 7, 2018¹, through January 12, 2018. The last tracklog recorded was determined to pertain to the accident and started at 00:10:56 UTC and ended at 02:00:48 UTC on January 12, 2018. The difference between UTC and Pacific Standard Time (PST) is 8 hours.

3.4. 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	Parameter Description
Date	Date for recorded data point (MM/DD/YYYY)
Time	Time (UTC) for recorded data point (HH:MM:SS)
Latitude	Recorded Latitude (degrees)
Longitude	Recorded Longitude (degrees)
GPS Alt	Recorded GPS Altitude (feet)
Groundspeed	Average derived groundspeed (knots)
Track	Average derived true course (degrees)

3.5. OVERLAYS AND TABULAR DATA

Figure 2 is a graphical overlay generated using Google Earth for the entire accident flight. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording. The flight departed from McClellan Airfield (MCC), Sacramento, California at approximately 00:10:56 UTC. The last recorded parameter from the flight was at 02:00:48 UTC.

Figure 3 is a graphical overlay generated using Google Earth zoomed in on the last portion of the accident flight.

Tabular data used to generate figures 2 and 3 are included as Attachment 1. This attachment is provided in electronic comma-delimited (.CSV) format.

¹ All dates and times are referenced to Coordinate Universal Time (UTC).

Figure 2. Google Earth overlay showing the entire accident flight.

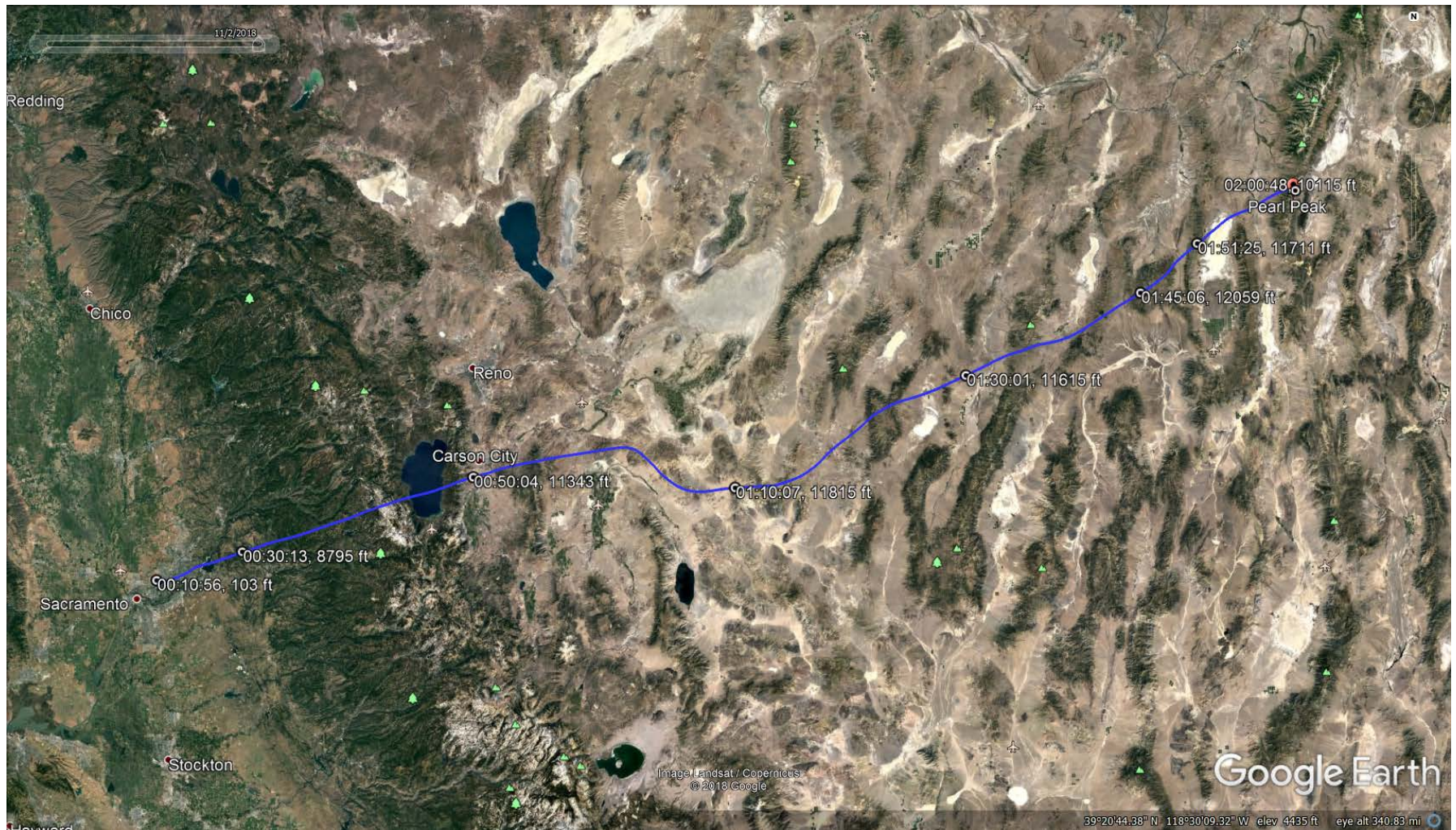


Figure 3. Google Earth overlay showing the end of the accident flight.

