

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, D.C. 20594

January 7, 2020

Global Positioning System Device

Specialist's Factual Report
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1. EVENT SUMMARY

Location: American Falls, Idaho
Date: October 25, 2019
Aircraft: Mooney M-20J
Registration: N201BJ
Operator: Private
NTSB Number: WPR20FA015

On October 25, 2019, about 1109 mountain daylight time (MDT), a Mooney M-20J airplane, N201BJ, impacted terrain near American Falls, Idaho. The private pilot was fatally injured, and the airplane sustained substantial damage to both wings and fuselage. The airplane was registered to the pilot who was operating it as a Title 14 *Code of Federal Regulations* Part 91 cross-country flight. Visual meteorological conditions prevailed about the time of the accident, and no flight plan was filed. The flight departed Dinsmore Airport (D63), Dinsmore, California at about 0745 pacific daylight time (PDT), and ultimately destined for Nashua Airport, New Hampshire.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

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

Device Manufacturer/Model:	Garmin GPSMAP 696
Device Serial Number:	1H6008827

3.1. 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, 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 memory¹. 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

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

button-battery is used to back-up power to the internal memory and real-time clock during those periods when main power is removed.

3.1.1. Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the device had sustained impact damage, as shown in Figure 1, resulting in cracks to the display. An interior examination revealed that components on the logic board had been dislodged. The board was repaired and attempted to be powered on using surrogate lab parts, however, the device was unable to power on normally. The non-volatile memory chip was removed, read out, and converted to engineering units using laboratory tools.

Figure 1. Garmin GPSMAP 696 as received.



3.1.2. Data Description

The data extracted included 42 sessions from May 30, 2019, through October 25, 2019 UTC. The last session started at 14:11:25 UTC and ended at 17:09:23 UTC on October 25, 2019, and was determined to pertain to the accident. The difference between MDT and UTC is 6 hours and the difference between PDT and UTC is 7 hours.

3.1.3. Parameters Provided

Table 1 describes data parameters recorded and derived by the device.

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)

4. 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 recording started at 14:11:25 UTC and ended at 17:09:23 UTC. Due to data buffering on the GPS unit, the data recording may have ended before impact.

Figure 3 is a graphical overlay generated using Google Earth at the end of the accident flight.

The tabular data recorded is included as Attachment 1 in electronic comma separated value (csv) format.

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

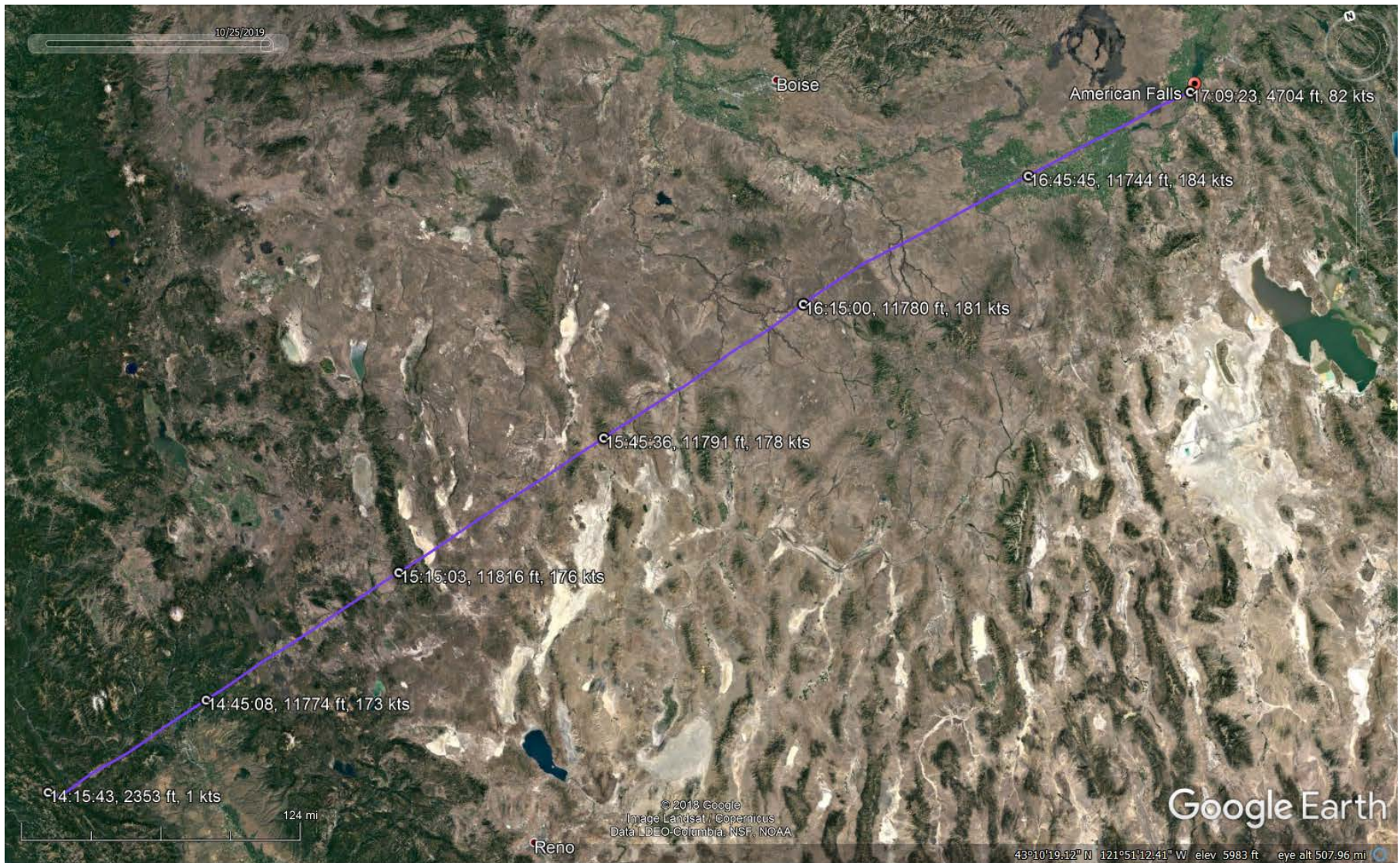


Figure 3. Google Earth overlay of the end of the accident flight.

