

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

September 17, 2019

Global Positioning System (GPS) Device

Specialist's Factual Report

By Sean Payne

1. EVENT SUMMARY

Location: Whittier, AK
Date: May 12, 2018
Aircraft: Piper Cherokee PA-28-180
Registration: N7061W
Operator: Private
NTSB Number: ANC18FA036

On May 12, 2018, about 0940 Alaska daylight time, a Piper Cherokee PA-28-180 airplane, N7061W, sustained substantial damage after impacting remote, mountainous, snow-covered terrain about 1 mile south-southeast of Whittier, Alaska. The student pilot sustained fatal injuries. The airplane was registered to and operated by the pilot as a 14 *Code of Federal Regulations* (CFR) Part 91 visual flight rules solo cross-country flight. Visual meteorological conditions existed at the departure airport and no flight plan was filed. The flight originated from the Merrill Field Airport (MRI), Anchorage, Alaska, about 0859, and was destined for the Valdez Pioneer Field Airport (VDZ), Valdez, Alaska.

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 Aera 500
Serial Number:	1QN005616

3.1. Device Description

The Garmin Aera 500 is a portable GPS navigation device employing 4.3 inch touch-screen and color moving map display. The Aera is capable of storing tracklogs that contain position location information for a number of points in non-volatile memory. This

data is stored internally in an industry-standard format and may be transferred to a PC running Windows Explorer via USB.

3.2. Data Recovery

The device was damaged in the accident. The device was disassembled, and its main board was installed in a surrogate device of the same model. The device was then downloaded normally.



Figure 1. Photo of damaged Garmin Aera 500.

3.3. Data Description

The data extracted included 46 track logs. The accident flight was identified as the 46th tracklog.

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. All times are given in UTC.

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

All times are given in UTC.

Figure 2 shows the aircraft's departure from MRI.

Figure 3 shows the overall route of flight. The graphic is oriented north-up.

Figure 4 shows the end of the recorded tracklog. The wreckage location is shown as a yellow pin. At the last recorded tracklog point, the aircraft was at 1,352 feet MSL at 95 knots groundspeed. The aircraft was headed southeast.

In this device, it is normal for the last tracklog points to be unrecoverable. The last tracklog points are assumed to be lost in the device's volatile buffer which potentially operates from a SDRAM¹ chip inside the device.

Tabular data used to generate figures 2 through 4 are included as Attachment 1. This attachment is provided in electronic comma-delimited (.CSV) format.

¹ SDRAM – synchronous dynamic random-access memory. A type of volatile memory.

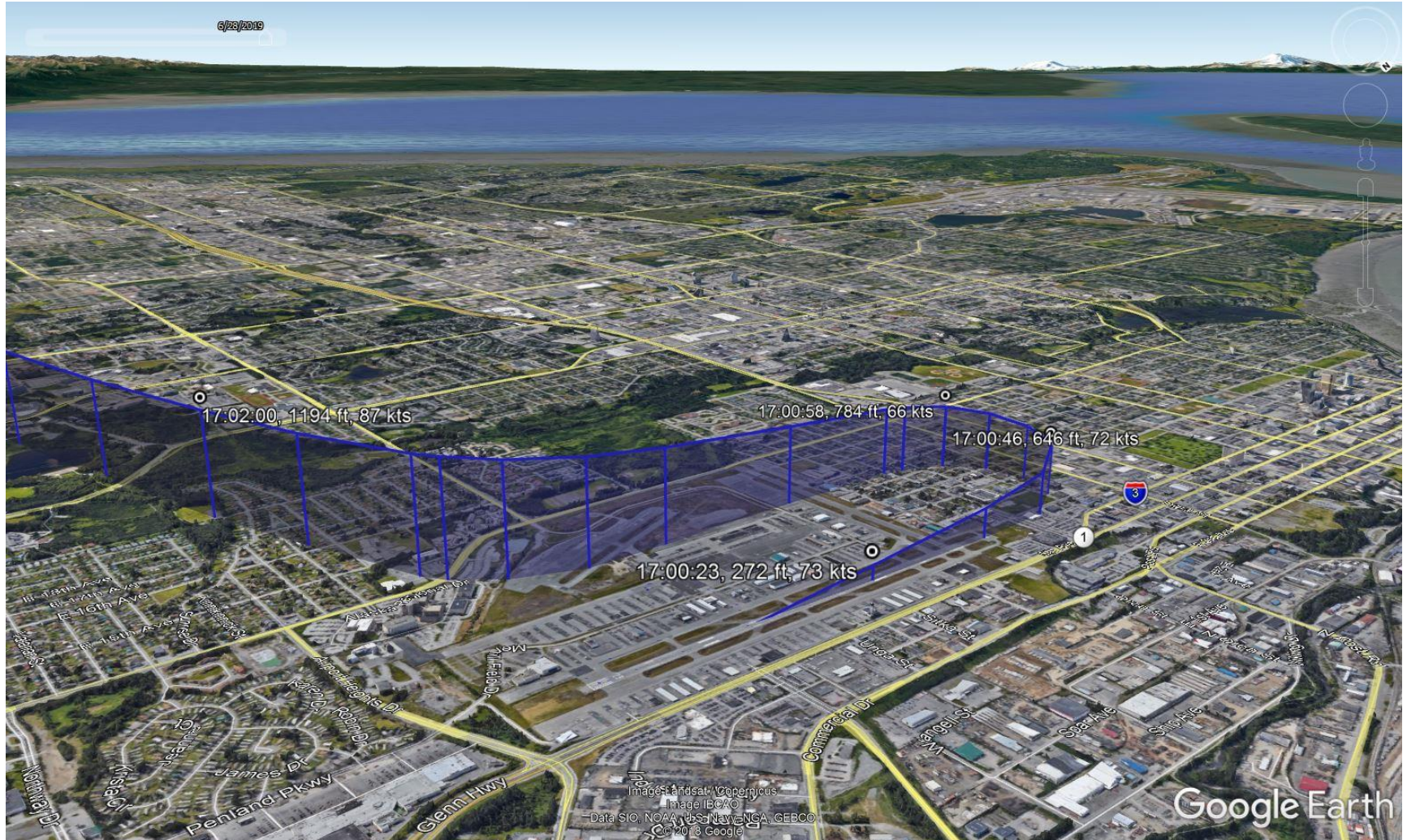


Figure 2. Google Earth overlay showing the aircraft's departure from MRI.

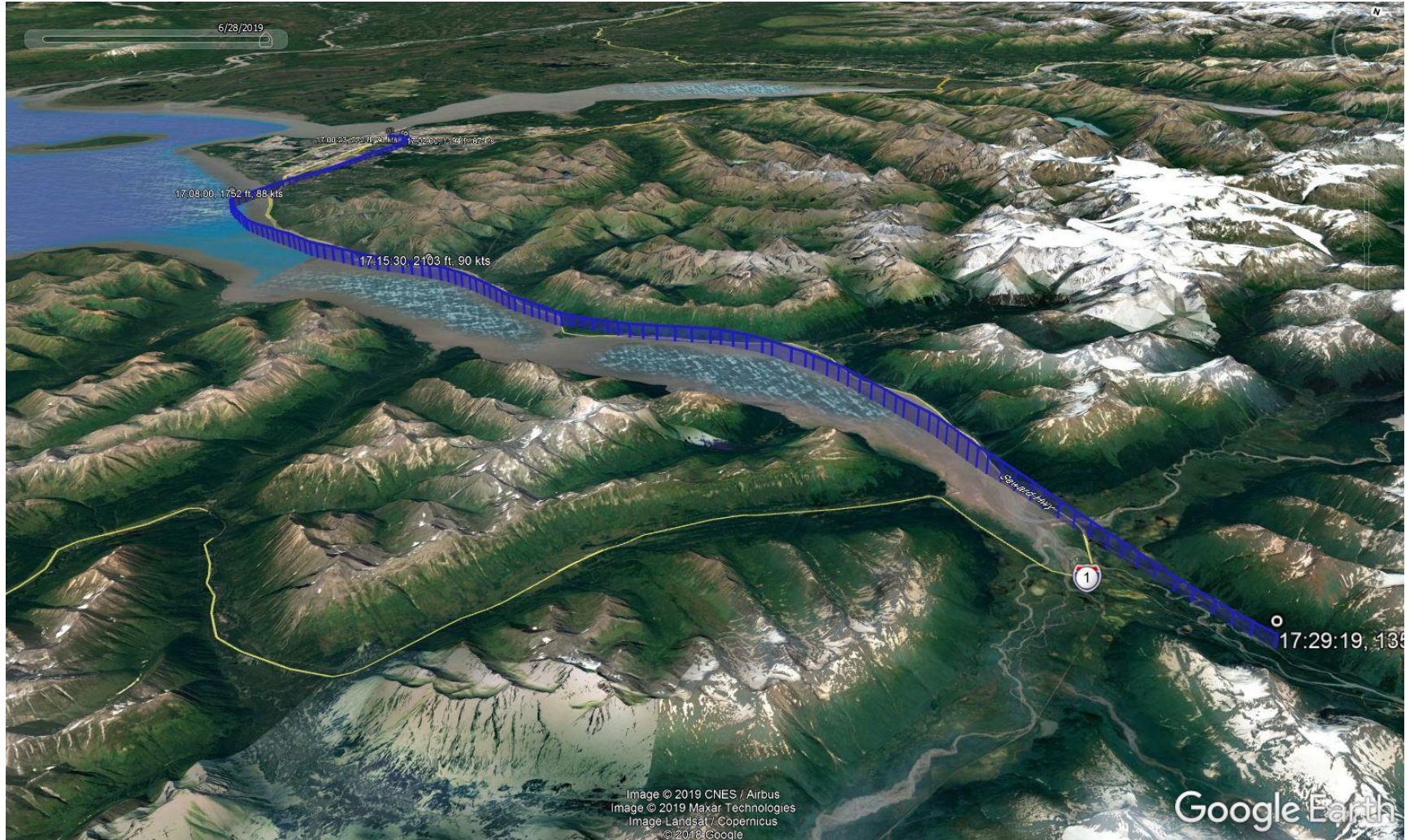


Figure 3. Google Earth overlay showing the aircraft's overall route of flight.

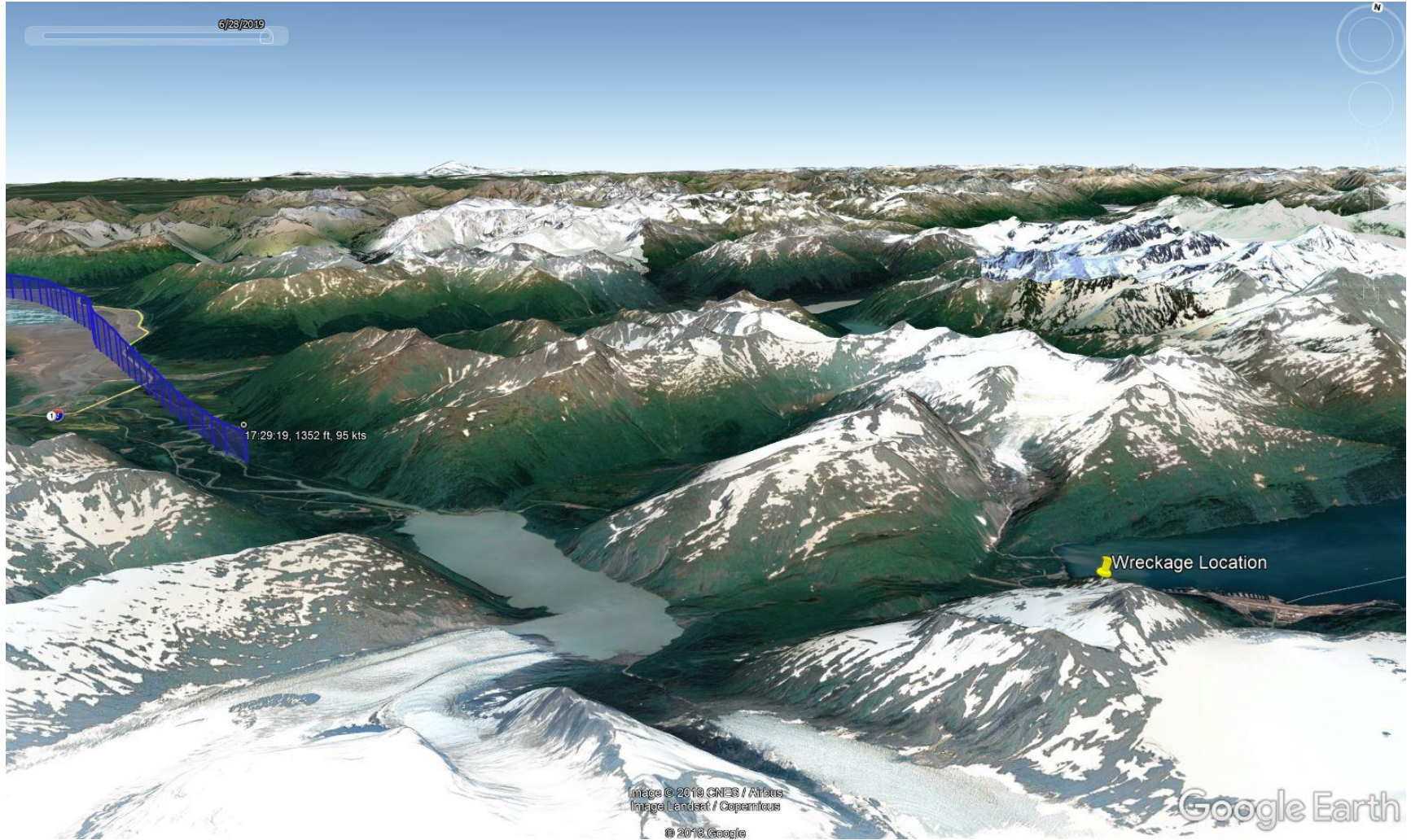


Figure 4. Google Earth overlay showing the end of the recorded tracklog in relation to the wreckage location.