

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

January 28, 2019

Electronic Devices

Specialist's Factual Report
by Gerald Kawamoto

1. EVENT SUMMARY

Location: Pomeroy, Washington
Date: January 27, 2018
Aircraft: Hughes 369D
Registration: N369TH
Operator: Private
NTSB Number: WPR18FA074

On January 27, 2018, about 1534 Pacific Standard Time, a Hughes 369D Helicopter, N369TH, impacted terrain under unknown circumstances about 10 miles northwest of Pomeroy, Washington. The commercial pilot and one passenger were seriously injured, and one passenger was fatally injured. The helicopter was substantially damaged. The helicopter was registered to McCall Helicopters Inc, and operated by Kiwi Air, doing business as Hells Canyon Helicopters as a 14 *Code of Federal Regulations* Part 91 wildlife capture flight. Visual meteorological conditions prevailed, and no flight plan was filed. The local flight originated from a nearby staging area about 1515.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

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

Device 1: Apple iPhone 7 Plus
Device 1 Serial Number: N/A
Device 2: Garmin GPSMAP 496
Device 2 Serial Number: 19728256
Device 3: Garmin eTrex 10
Device 3 Serial Number: 2DR958379

3.1. Apple iPhone 7 Plus Device Description

Personal Electronic Devices (PEDs) are a category of devices comprised primarily of portable computing devices and mobile phones. Portable computing devices are typically capable of internet access, email, messaging services, and can run user-installed applications to perform specific tasks. Depending on the model, mobile phones can perform many of the same tasks as portable computing devices, plus have voice call and text messaging capabilities. PED user and system data is typically stored on non-volatile memory (NVM)¹ and can be accessed through manufacturer-provided interfaces.

3.1.1. Apple iPhone 7 Plus Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the unit had sustained impact damage, as shown in Figure 1. The device was unable to power on normally and the main board was removed and installed in a surrogate device. The surrogate device powered on normally but was password protected. The Investigator-In-Charge (IIC) determined that further data recovery for this device would not be pursued.



Figure 1. Photo of damaged Apple iPhone 7 Plus as received.

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

3.2. Garmin GPSMAP 496 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 de-activated 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.

3.2.1. Garmin GPSMAP 496 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had not sustained any damage and information was extracted normally using the manufacturer's software.

3.2.2. Garmin GPSMAP 496 Data Description

The data extracted included 16 tracklogs from January 22, 2018, through January 27, 2018 Coordinated Universal Time (UTC). The last tracklog recorded was determined to pertain to the accident event and started at 21:06:31 UTC and ended at 23:35:29 UTC on January 27, 2018. The difference between UTC and Pacific Standard Time (PST) is 8 hours.

3.2.3. Garmin GPSMAP 496 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)

3.3. Garmin eTrex 10 Device Description

The Garmin eTrex 10 is a battery-powered portable GPS receiver with a 2.2" monochrome display. A 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. Tracklog storage may be activated or de-activated at user discretion. All recorded data is stored in non-volatile memory. 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 unit contains hardware and software permitting the download of recorded waypoint, route, and tracklog information to a PC via a built-in serial port.

3.3.1. Garmin eTrex 10 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had not sustained any damage and information was extracted normally using the manufacturer's software.

3.3.2. Garmin eTrex 10 Data Description

The data extracted included 35 tracklogs from January 18, 2018, through January 28, 2018. The last tracklog recorded was determined to pertain to the accident event and started at 21:44:30 UTC on January 27, 2018, and ended at 20:05:00 UTC on January 28, 2018. The last recorded data point pertaining to the accident event occurred at 23:35:34 UTC. The device remained powered on after the accident event and continued to record static data until the battery was exhausted at the end time indicated on January 28, 2018. Data from the accident from the eTrex 10 and GPSMAP 496 were compared

and some differences were revealed between the data sets. The differences are discussed in Overlays and Tabular Data and are shown in Figures 2 through 5.

3.3.3. Garmin eTrex 10 Parameters Provided

The eTrex 10 provides the same data parameters as the GPSMAP 496, which are listed in Table 1.

3.4. Overlays and Tabular Data

Figure 2 is a graphical overlay generated using Google Earth for the accident flight. Data from the eTrex 10 is shown in red and data from the GPSMAP 496 is shown in blue. The flight originally took off from Clarkson, Washington about 2106 UTC and departed the area to the west before proceeding north of highway 12. The eTrex 10 recorded its first data point approximately 38 minutes after the flight departed. The helicopter proceeded generally north along the Snake River for about two hours before a planned refueling stop. The last recorded data point on the GPSMAP 496 was at 23:35:29 UTC on January 27, 2018. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

Figure 3 is a graphical overlay generated using Google Earth showing a difference between the eTrex 10 and GPSMAP 496 data sets. The eTrex 10 did not record any data points between 22:39:10 UTC and 22:48:01 UTC.

Figures 4 and 5 are graphical overlays generated using Google Earth showing differences in the data during the refueling portion of the flight. Labels on Figure 4 correspond to the GPSMAP 496 and labels on Figure 5 correspond to the eTrex 10.

The GPSMAP 496 shows the helicopter entered the refueling area about 2254 UTC then proceeded to fly around the general area for about 11 minutes before coming to a stop about 2305 UTC. The device is shown leaving the area at 23:11:33 UTC.

The eTrex 10 shows the helicopter entering the refueling area at the same time as the GPSMAP 496. Between about 2256 and 2311 UTC the device logged over 50 data points at a static location corresponding to the same location the GPSMAP 496 was stopped between 2305 and 2311 UTC. The device is shown leaving the area at 23:11:33 UTC.

Figure 6 is a graphical overlay generated using Google Earth at the end of the accident flight.

Tabular data used to generate figures 2 through 6 are included as Attachment 1 for GPSMAP 496 data and Attachment 2 for eTrex data. These attachments are provided in electronic comma-delimited (.CSV) format.

Figure 2. Google Earth overlay showing the entire accident flight as recorded on the GPSMAP 496 and eTrex 10.

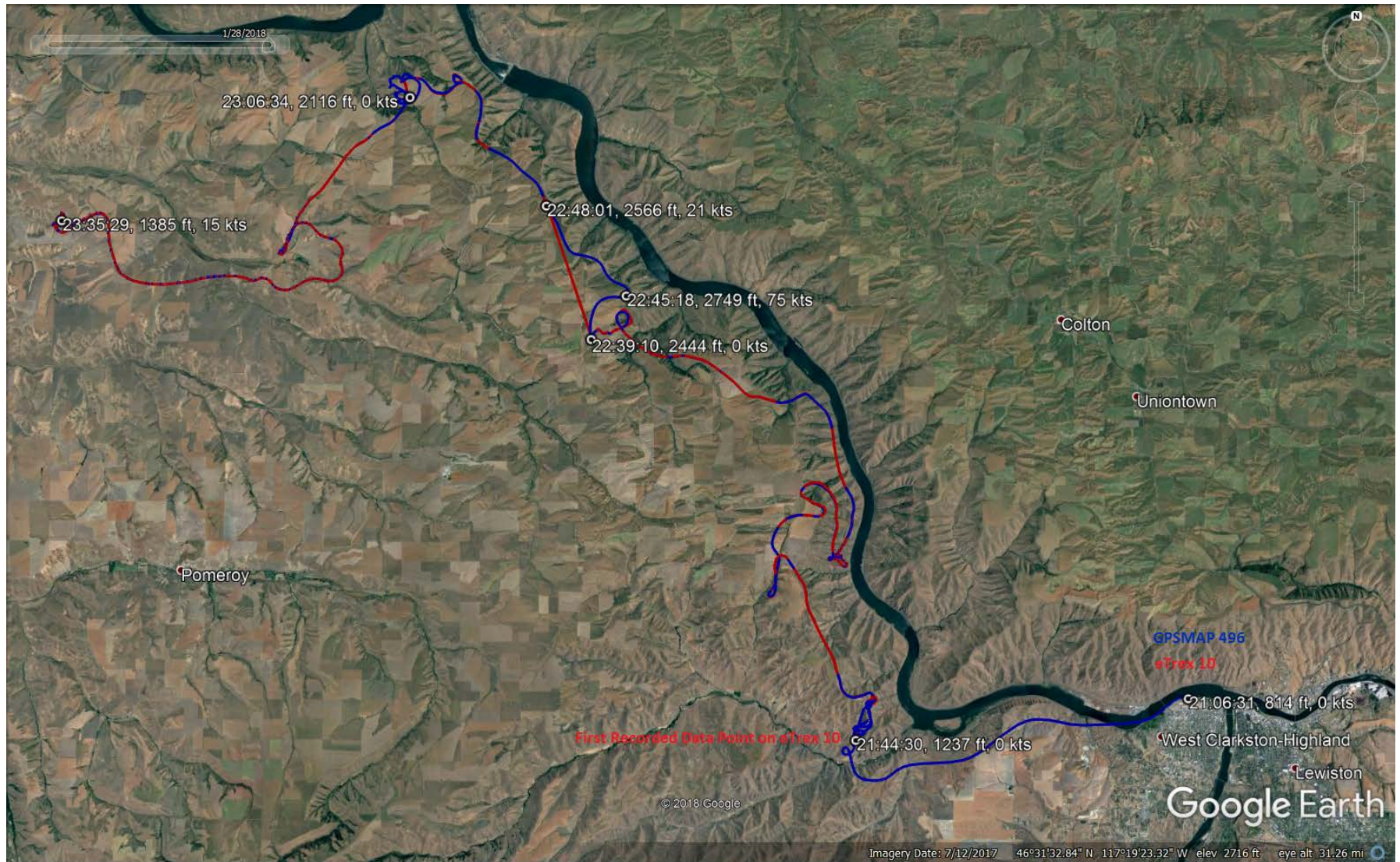


Figure 3. Google Earth overlay showing a difference between the recorded GPSMAP 496 and eTrex 10 data.

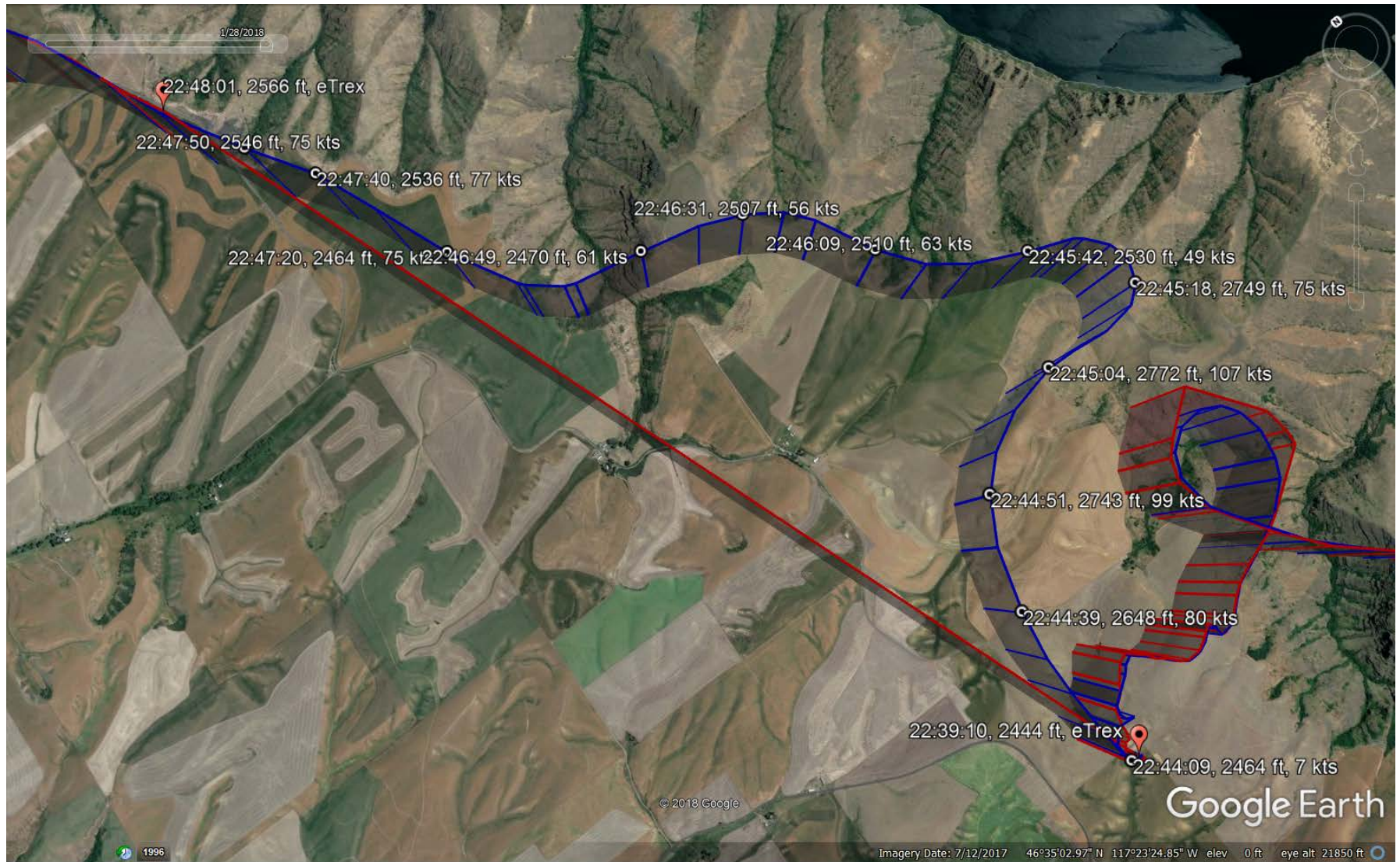


Figure 4. Google Earth overlay showing the refueling portion of the flight. Data points from the GPSMAP 496 are labeled.

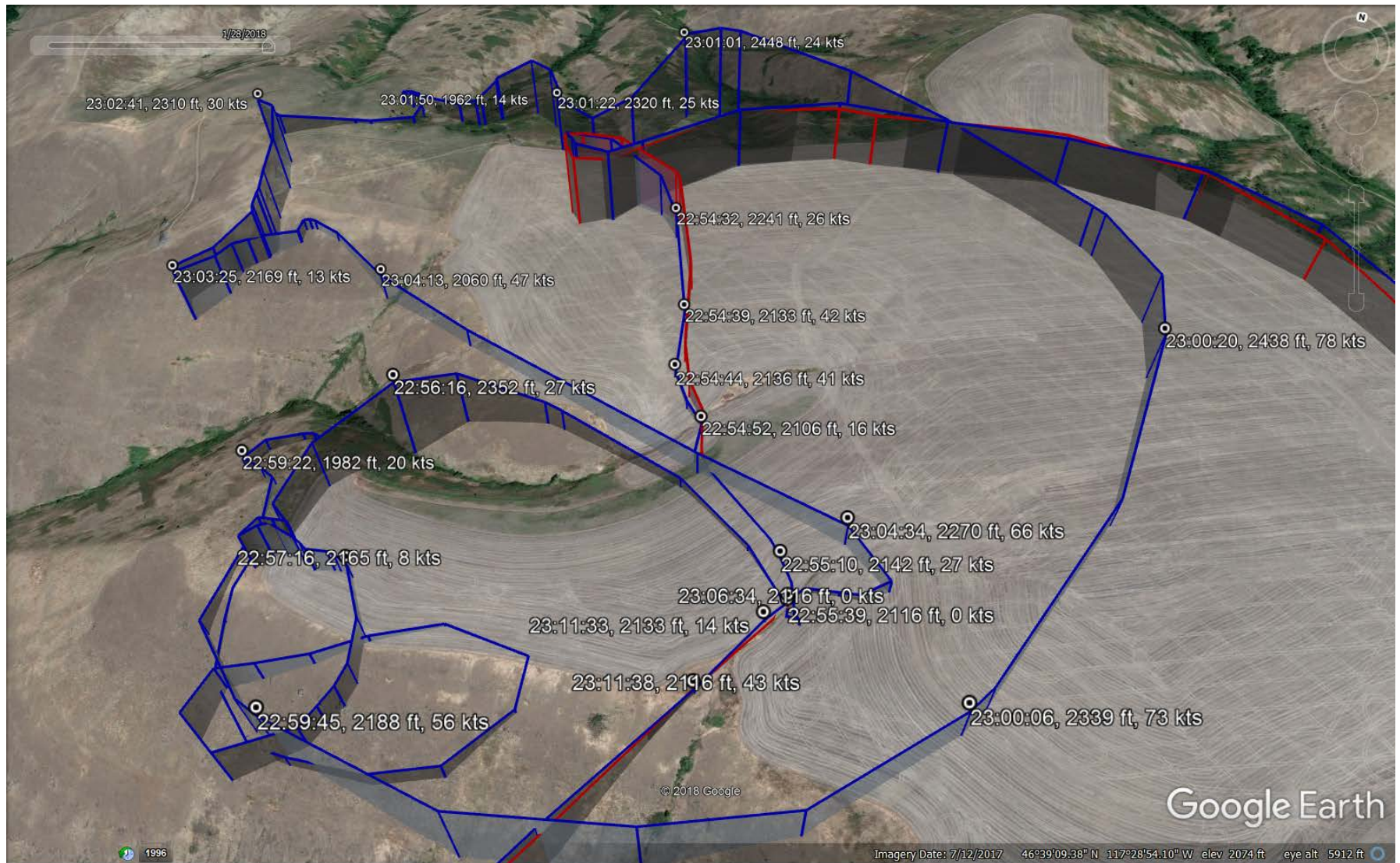


Figure 5. Google Earth overlay showing the refueling portion of the flight. Data points from the eTrex 10 are labeled.



Figure 6. Google Earth overlay showing the end of the accident flight.

