

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

May 20, 2019

Personal Electronic Device

**Specialist's Factual Report
By Gerald Kawamoto**

1. EVENT SUMMARY

Location: Alexandria, MN
Date: July 28, 2018
Aircraft: Aeronca 7AC
Registration: N85506
Operator: Private
NTSB Number: CEN18FA297

On July 28, 2018, about 1923 central daylight time, an Aeronca 7AC single-engine airplane, N85506, impacted powerlines and terrain while maneuvering at a low altitude near Alexandria, Minnesota. The pilot was fatally injured, and the airplane was substantially damaged. The airplane was registered to a private individual and operated by the private pilot under the provisions of Title 14 *Code of Federal Regulations (CFR)* Part 91 as a personal flight. Day visual meteorological conditions prevailed at the time of the accident. The local area flight departed Chandler Field Airport (AXN), Alexandria, Minnesota, about 1918.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

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

Device Manufacturer/Model: Apple iPhone 7
Serial Number: 359152076064050

3.1. Device Description

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. PED user and system data is typically stored on non-volatile memory¹ and can be accessed through manufacturer-provided interfaces.

3.2. Data Recovery

The device was in good condition upon arrival at the Vehicle Recorder Laboratory and powered on normally.

4. DEVICE INVESTIGATION

Upon powering, ForeFlight² was in the recently used applications. A Track Log pertaining to the accident flight was recorded. The data were sampled at 1 Hz. The following five figures were generated using data from the ForeFlight Track Log. Table 1 describes data parameters recorded by the device in ForeFlight.

Table 1: ForeFlight 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)
Altitude	Recorded GPS Altitude (feet)
Ground Speed	Recorded Ground Speed (knots)
Course	Recorded True Course (degrees)

Figure 1 is a Google Earth overlay of the Track Log for the entire flight recording. 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 00:06:45 Coordinated Universal Time (UTC) and ended at 00:34:58 UTC. The difference between central daylight time and UTC is 5 hours.

Figures 2 and 3 are Google Earth overlays of the Track Log at the end of the recording. Figure 2 shows recorded points prior to 00:20:14 UTC and Figure 3 shows recorded points from 00:20:14 UTC onward.

The recorded location from the Track Log overshoots the reported wreckage location in the northerly direction. At 00:20:14 UTC the recorded location reaches its northern most point. Over the next 2 minutes the recorded location “drifts” in a southerly direction back towards the wreckage location. At 00:22:10 UTC the recorded location coincides with the wreckage location. It is unclear as to when and where the device was recovered and if it was separated from the wreckage. Discrepancies in device location may be attributed to

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

² iOS Device application capable of displaying the aircraft's altitude, navigation, weather, and traffic information. The application can be used for flight planning, charts, airport information, document management, and flight logging.

uncertainties in where the device was mounted and its visibility to the sky. Additional inaccuracies may be attributed to the internal GPS of the device and may be aggravated at higher speeds. According to the ForeFlight website:

"Due to the way the iOS operates, an iPad or iPhone internal GPS will never display better than 5-10m accuracy. **An external GPS receiver** may perform better when a limited view of the sky is available to the iPad, and may provide more consistent fixes with better accuracy."

Figure 4 is a plot of parameters for the entire flight recording.

Figure 5 is a plot of parameters recorded between 00:15 and 00:21 UTC.

Tabular Data used to generate Figures 1 through 5 are included in electronic comma separated variable (.csv) format as Attachment 1 to this report.

Figure 1. Google Earth overlay of the recorded Track Log for the entire flight.

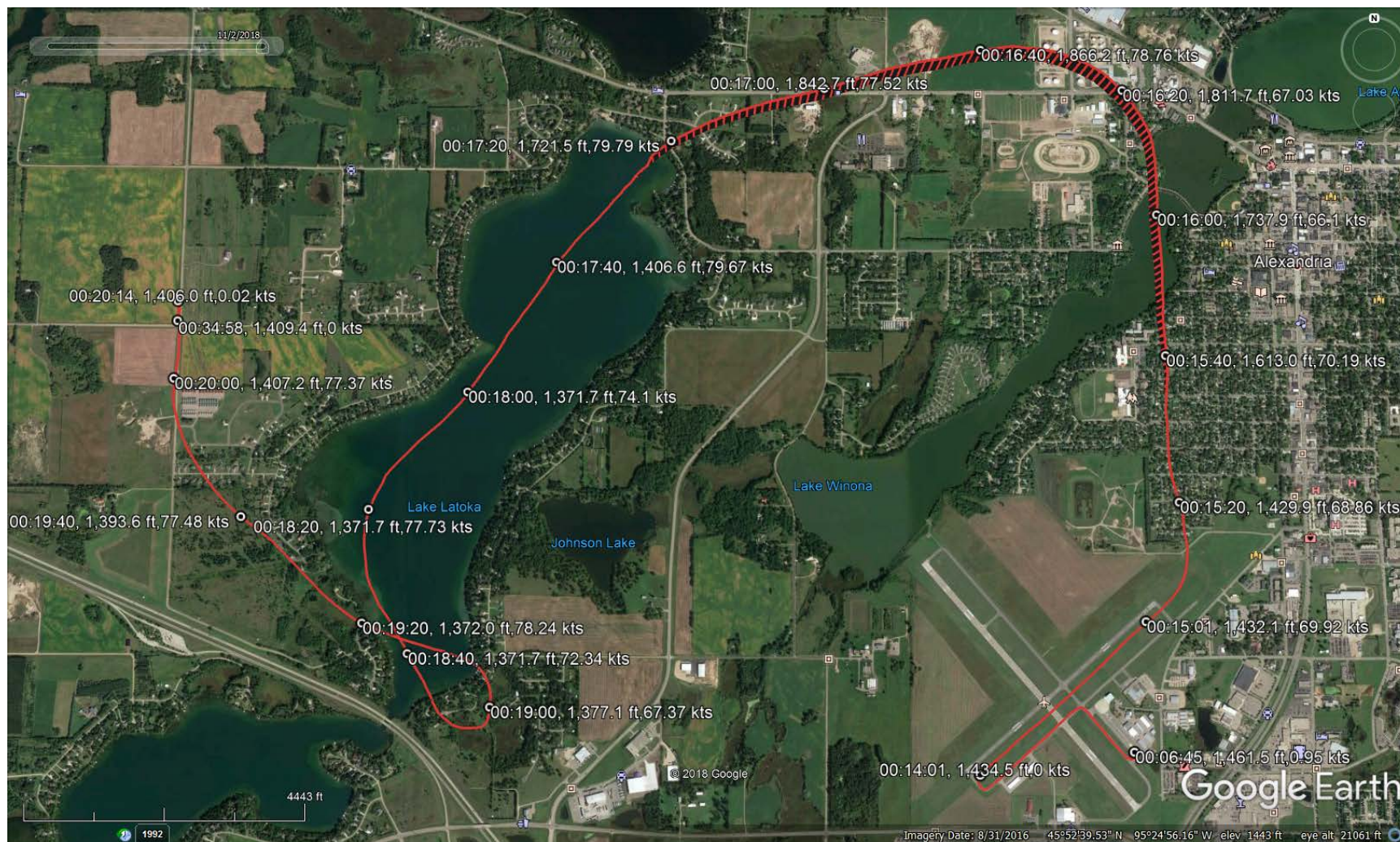


Figure 2. Google Earth overlay of the recorded Track Log at the end of the accident flight. Times prior to 00:20:14 UTC are shown.

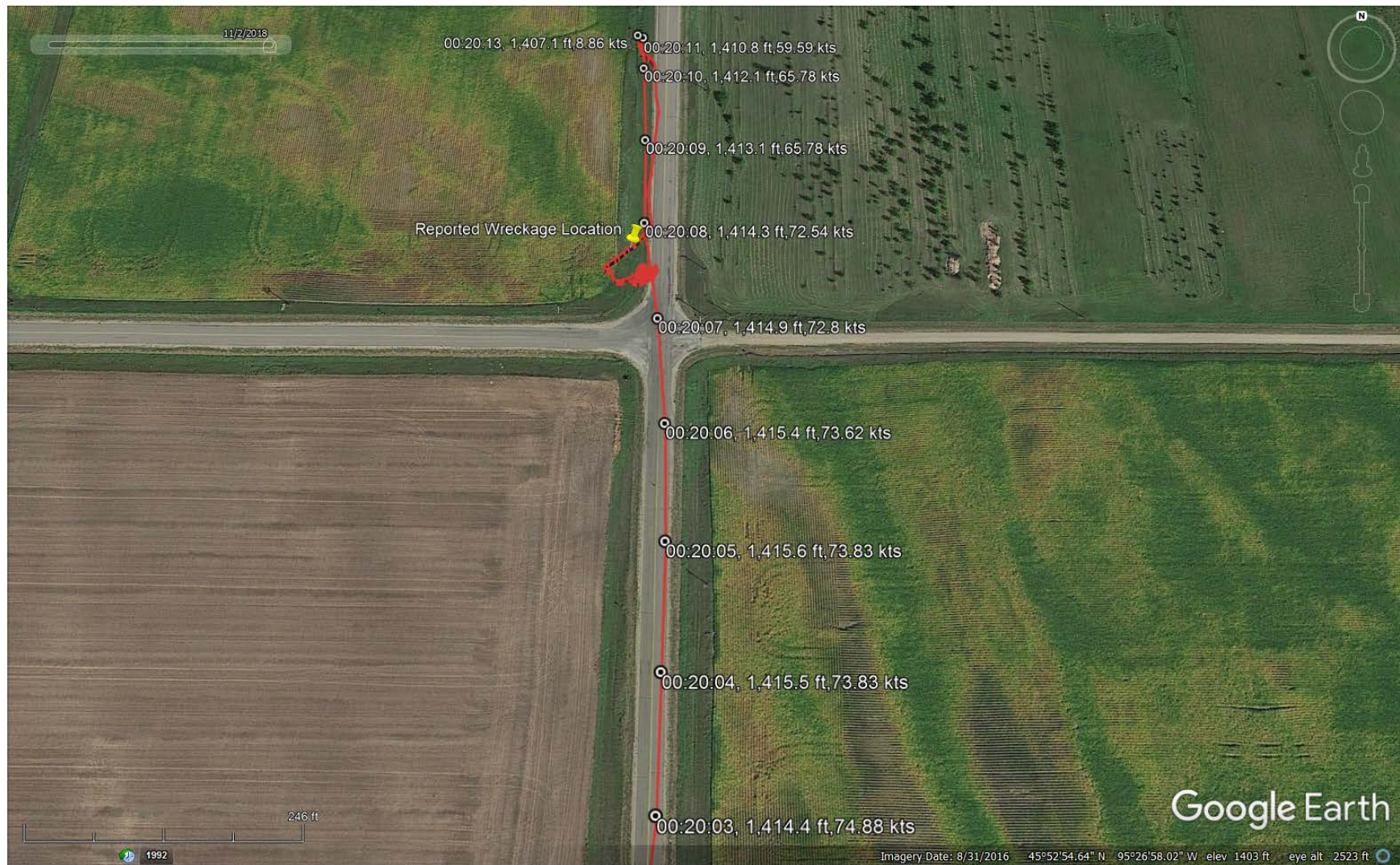


Figure 3. Google Earth overlay of the recorded Track Log at the end of the accident flight. Times from 00:20:14 UTC onward are shown.

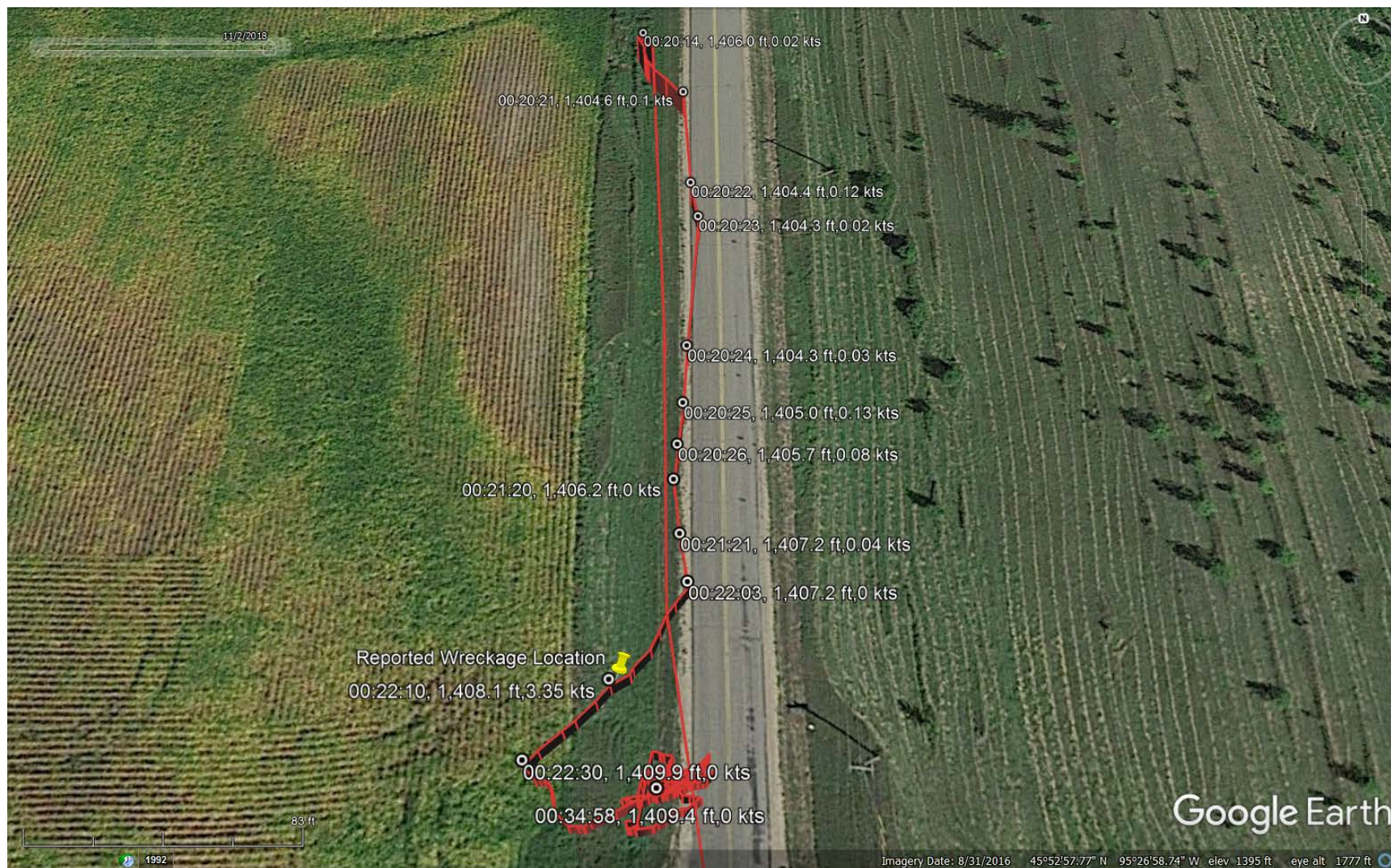


Figure 4. Plot of parameters recorded in ForeFlight on the iPhone of the entire flight recording.

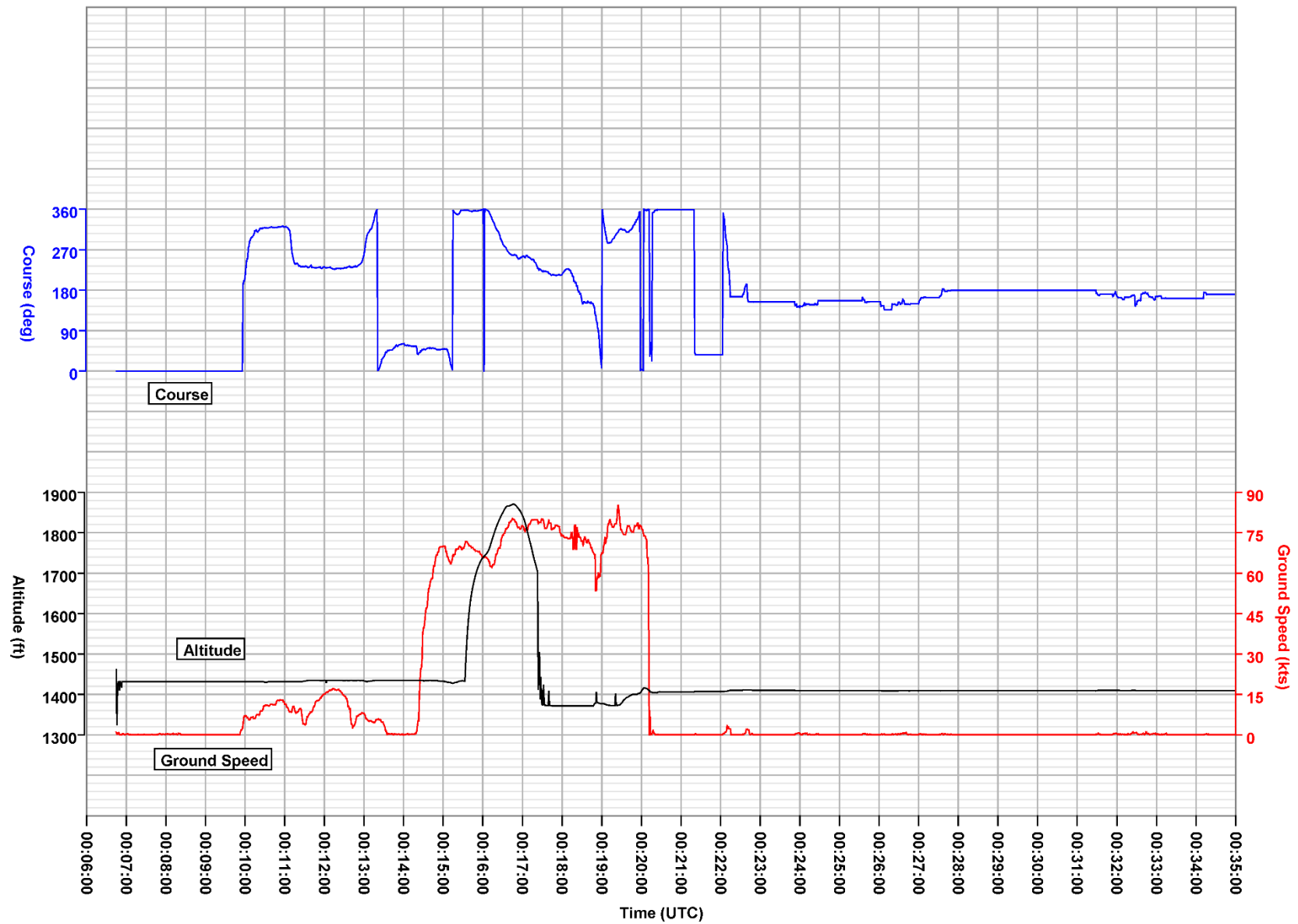


Figure 5. Plot of parameters recorded in ForeFlight on the iPhone between 00:15 and 00:21 UTC.

