

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

November 6, 2019

Personal Electronic Device

Specialist's Factual Report By Gerald Kawamoto

1. EVENT SUMMARY

Location: Chebanse, Illinois
Date: July 5, 2019
Aircraft: Beech A36
Registration: N1809S
Operator: Private
NTSB Number: CEN19FA210

On July 5, 2019, about 1358 central daylight time (CDT), a Beech A36 airplane, N1809S, was substantially damaged during a forced landing following an in-flight loss of engine power near Chebanse, Illinois. The pilot sustained serious injuries, one passenger sustained minor injuries, and one passenger was fatally injured. The airplane was registered to and operated by private individuals as a Title 14 *Code of Federal Regulations* Part 91 as a personal flight. Visual meteorological conditions prevailed at the time of the accident, and the flight was not operated on a flight plan. The flight originated from Smyrna Airport (MQY), Smyrna, Tennessee, about 1135 and was destined for Bolingbrook's Clow International Airport (1C5), Bolingbrook, Illinois.

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 iPad Mini 4
Serial Number:	F9FTG0FJGHMN

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

Upon arrival at the Vehicle Recorder Laboratory, an external examination revealed the device had sustained impact damage resulting in damage to the screen, as shown in Figure 1. The screen was replaced with a functioning lab surrogate and the device powered on normally.

Figure 1. iPad Mini 4 as received.



4. DEVICE INVESTIGATION

Upon powering, ForeFlight² was in the recently used applications. Two track logs from July 5, 2019³, were recorded and are included in this report. The last track log was determined to be the accident flight. A review of track logs in ForeFlight indicated that multiple sources had been utilized as the GPS source throughout the track log history, including Connex⁴, and multiple iOS devices. If more than one GPS source is in use at a time, the ForeFlight app prioritizes which GPS source to use based upon a hierarchy. Any Garmin devices being used as the source will take the highest priority. Connex was indicated as the GPS source for the accident flight and the pilot's iPad was the GPS source for the first flight on July 5, 2019. 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."

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.

³ All dates and times referenced to Coordinated Universal Time (UTC).

⁴ Garmin feature that can provide wireless connectivity to an instrument panel. It allows the user to connect an iPad to Garmin avionics and can send ADS-B weather and traffic, GPS position data, flight plan information, AHRS, and other information to ForeFlight or Garmin Pilot apps. The actual information sent to the iPad depends on the capabilities of the wireless data communication source and configuration of the aircraft.

The data were sampled at 1 Hz, however, occasionally larger gaps between data points, such as four seconds between samples, were observed. The following four figures were generated using data from the ForeFlight track logs. Table 1 describes data parameters recorded 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	Derived Ground Speed (knots)
Course	Derived True Course (degrees)
Pitch	Pitch Angle (degrees)
Bank	Bank Angle (degrees)

Figure 2 is a Google Earth overlay of 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 aircraft departed Smyrna Airport (MQY), Smyrna, Tennessee, about 16:34 UTC and the last recorded data point was at 18:41:09 UTC about 4 miles east of Chebanse, Illinois.

Figure 3 is a Google Earth overlay of the track log at the end of the accident flight. The reported wreckage location is approximately one quarter of a mile from the last recorded data point.

Figure 4 is a plot of parameters recorded in ForeFlight for the entire accident flight. The time interval plotted is 16:00:00 UTC to 18:50:00 UTC. Pitch and Bank recorded zero values for the first 50 minutes. The source of these parameters may have been a device connected wirelessly via Connex, however, the status and recording logic of the source is uncertain.

Figure 5 is a Google Earth overlay of the first track log recorded on July 5, 2019. The flight originated from Effingham County Memorial Airport (IH2), Effingham, Illinois, about 14:00 UTC and landed at MQY about 15:34 UTC.

Tabular Data used to generate Figures 2 through 4 are included in electronic comma separated variable (.csv) format as Attachment 1 to this report. Tabular Data used to generate Figure 5 is included in electronic comma separated variable (.csv) format as Attachment 2 to this report.

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

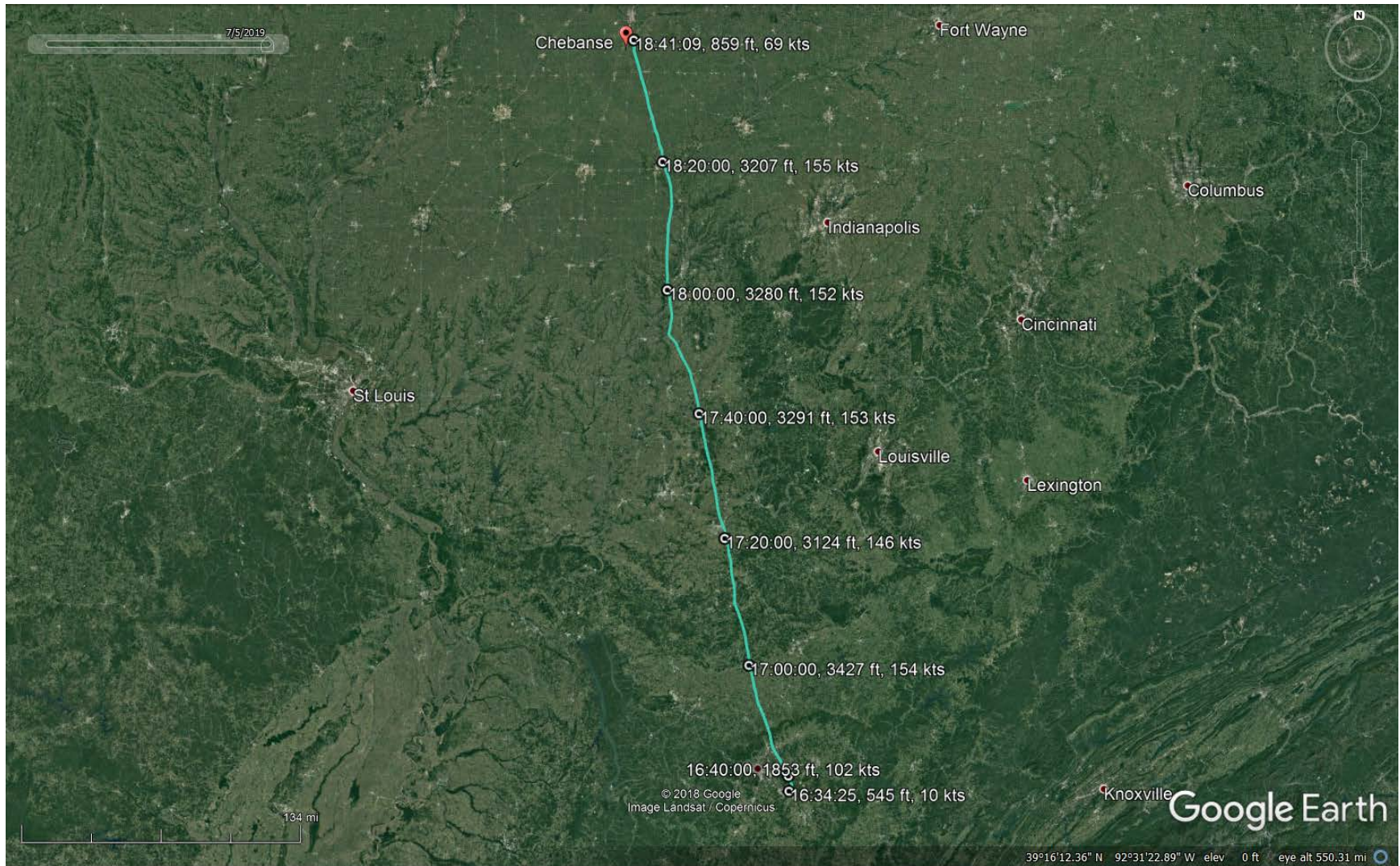


Figure 3. Google Earth overlay at the end of the accident flight.

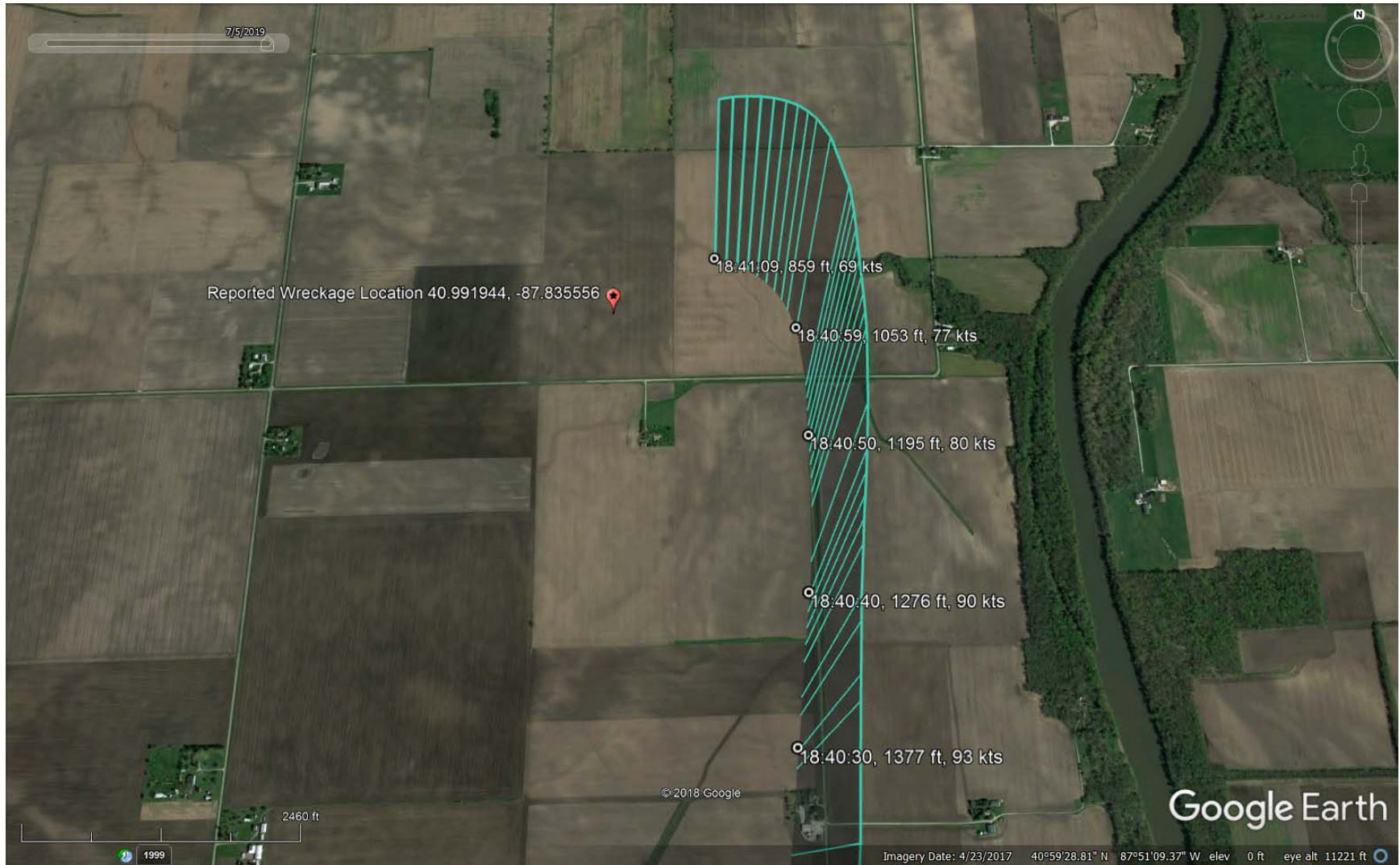


Figure 4. Plot of parameters recorded in ForeFlight for the accident flight.

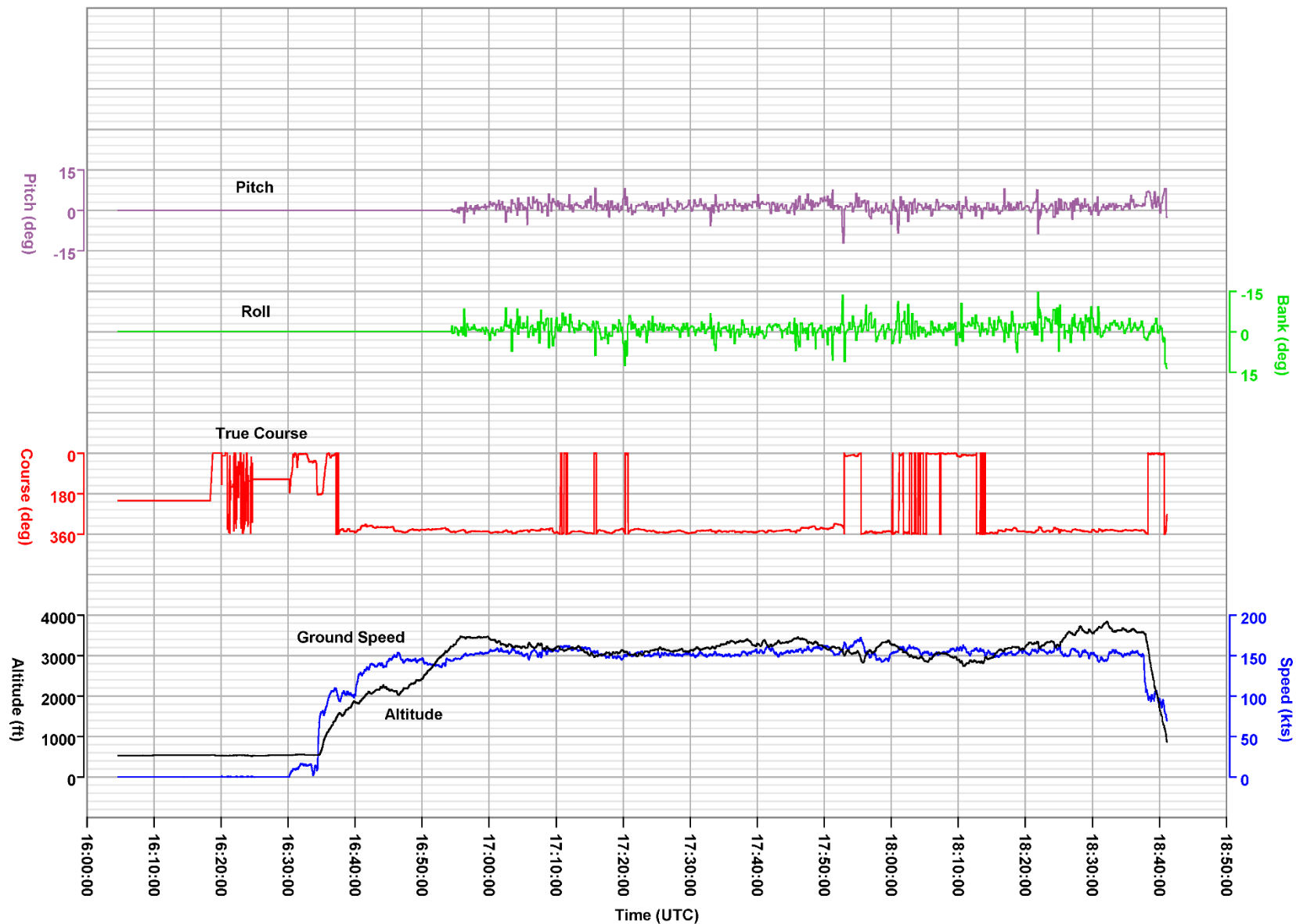


Figure 5. Google Earth overlay showing the first track log recorded on July 5, 2019.

