

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

April 15, 2021

Electronic Devices – Recorded Flight Data

Specialist's Factual Report
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1. EVENT SUMMARY

Location: Pembroke Pines, Florida
Date: December 17, 2020
Aircraft: Socata TB10
Registration: N5547Y
Operator: Private
NTSB Number: ERA21LA080

2. RECORDED FLIGHT DATA GROUP

A recorded flight data group was not convened.

3. DETAILS OF INVESTIGATION

On January 25, 2021, the National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following electronic devices:

Device 1 Manufacturer/Model:	Crew Dog Stratux ADS-B Receiver
Serial Number:	N/A

Device 2 Manufacturer/Model:	Apple iPad Mini 4
Serial Number:	F9VK3NNGHVN

3.1. Crew Dog Stratux ADS-B Receiver Description

The Crew Dog Stratux ADS-B receiver is a portable ADS-B transceiver. The unit generates a WiFi network which allows portable electronic devices like smart phones and tablet devices to connect and exchange data. Portable electronic devices can then receive and display ADS-B information via electronic flight bag software (ex. ForeFlight).

3.1.1. Crew Dog Stratux ADS-B Receiver Data Recovery

Upon arrival at the Vehicle Recorder Division the device was determined to be undamaged as shown in Figure 1. The device transfers ADS-B information to portable electronic devices via WiFi, as described in the device description, but does not have data recording functionality. No data were recovered from the device.



Figure 1: Crew Dog Stratux ADS-B Receiver as received.

3.2. Apple iPad Mini 4 Description

Apple iPad mini 4 is a type of personal electronic device (PED). 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 memory¹ and can be accessed through manufacturer-provided interfaces.

3.2.1. Apple iPad Mini 4 Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the device had sustained severe impact damage, as shown in Figure 2. The motherboard was removed from the device, and powered on using surrogate laboratory parts. The device was then unlocked with a provided passcode. The data were reviewed with the investigator-in-charge (IIC), and ForeFlight was found running in the background. The accident flight track log was identified on the ForeFlight, and this track log was exported with laboratory tools. The previous track log on the ForeFlight was recorded on October 26, 2020, and it was for a different aircraft, thus it was not exported.

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



Figure 2: Front and back of Apple iPad mini 4 as received.

3.2.2. Apple iPad Mini 4 Data Description

The track log was recorded in Universal Coordinated Time (UTC) and was converted to local time of the accident, eastern standard time (EST). The validated recording points were from 16:35:11 to 16:36:37 on December 17, 2020, about 1 minute and 26 seconds total. The sampling rate was about one data point per second. Table 1 shows the parameters recorded on the track log.

Table 1: ForeFlight Track Log Parameters.

Parameter Name	Parameter Description
Time	EST for recorded data point (HH:MM:SS)
Long (deg)	GPS longitude in degrees
Lat (deg)	GPS latitude in degrees
alt (m)	GPS altitude (MSL) in meters
alt (ft)	GPS altitude (MSL) in feet
course (deg)	Direction of route of flight in degrees
speed (kts)	Ground speed in knots
bank (deg)	Bank angle in degrees
pitch (deg)	Pitch angle in degrees

3.3. Plots and Corresponding Tabular Data

Figure 3 is a plot of the parameters for the accident flight recorded on December 17, 2020. The time interval displayed is 16:35:10 to 16:36:40 EST. Note that the data highlighted in yellow for Course and Speed on the plot were determined to be invalid.

Figure 4 is a Google Earth overlay of the accident flight. The aircraft took off from the North Perry Airport around 16:35:11 and the last validated data point was recorded at 16:36:37. The reported wreckage location is shown with a red pin. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

The corresponding tabular data used to create figures 3 and 4 are provided in electronic comma-delimited (.csv) format as Attachment 1 to this report.

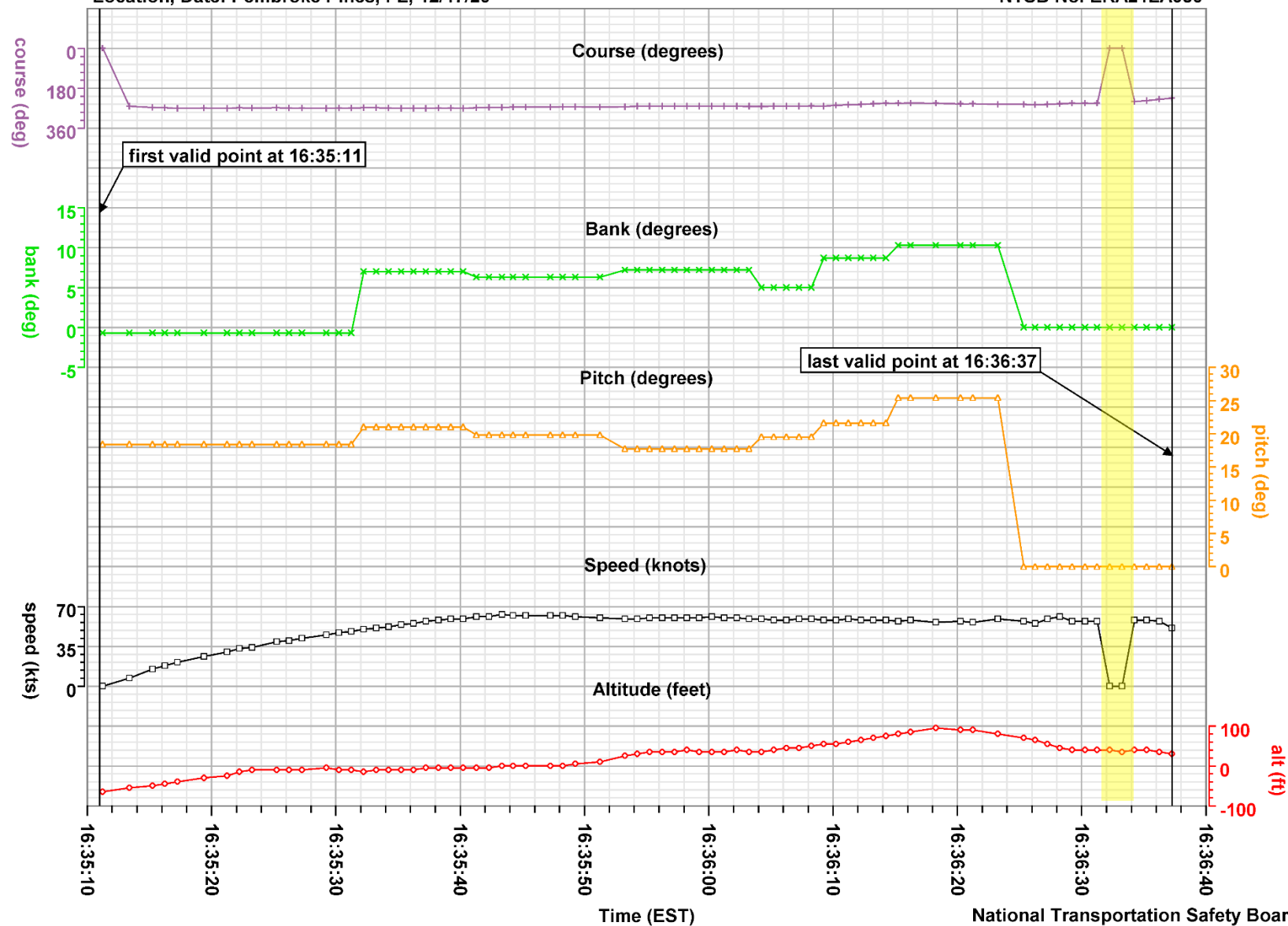


Figure 3: Plot of parameters for the accident flight recorded on December 17, 2020.



Figure 4: The overview of the accident flight on Google Earth.