

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

March 9, 2021

Personal Electronic Devices

Specialist's Factual Report By Sean Payne

1. EVENT SUMMARY

Location: Sioux Falls, SD
Date: June 7, 2020
Aircraft: Mitsubishi MU-2
Registration: N44MX
Operator: McNeely Charter Service, Inc.
NTSB Number: CEN20LA215

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 devices (PEDs):

Device Manufacturer/Model:	Apple iPad A2200 (7th Generation)
Serial Number:	cg72L0hvm004

Device Manufacturer/Model:	Apple iPad A1459 (4th Generation)
Serial Number:	dmpkp35lf189

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. 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) and can be accessed through manufacturer-provided interfaces.¹

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

3.2. Device Condition

Apple iPad A2200 (7th Generation)

The received device is shown in figure 1. The device's battery was removed prior to transport from the accident site to the laboratory for safety reasons. The device exhibited significant deformation damage. There was no obvious thermal damage. The device's main board was bent and cracked in multiple places. Numerous microelectronic components were either damaged or missing. Critical NVM components appeared largely intact according to a visual inspection.



Figure 1. The iPad A2200 (7th Generation), as received.

Apple iPad A1459 (4th Generation)

The received device is shown in figure 2. The device's battery was removed prior to transport from the accident site to the laboratory for safety reasons. The device exhibited significant deformation damage. There was no obvious thermal damage. The device's main board was bent and cracked in multiple places. Numerous microelectronic components were either damaged or missing. Critical NVM components appeared largely intact according to a visual inspection.



Figure 2. The iPad A1459 (4th Generation), as received.

3.3. Data Recovery

Apple iPad A2200 (7th Generation) & Apple iPad A1459 (4th Generation)

Both iPads were evaluated at the NTSB Vehicle Recorder Laboratory for potential data recovery. The extent of the damage exceeded the laboratory's repair capability and third-party data recovery labs were consulted for potential data recovery options. One third-party lab presented the possibility of transplanting critical NVM components from each device's main board to an appropriate surrogate device for each iPad. The third-party lab indicated that this process was somewhat experimental for Apple devices and there was no guarantee that the process would work. If a recovery attempt were successful for either device, data recovery may still be precluded if a passcode were enabled on the devices. In consultation with the Investigator-In-Charge (IIC) and the third-party lab, the likelihood of successful data recovery was determined to be unlikely.

Additionally, it is unclear how the pilot used the devices and how an extraction of data from the devices would impact the investigation. The IIC contacted the party coordinator from the aircraft operator who stated, "He would have probably used one of the iPads for his Flight Planning and for the purposes of navigation charts, approach plates, etc. I am not aware of him using an app on the iPad for electronic pilot logs."

Given flight path data was already extracted from a Garmin device involved in the accident, and no known evidence of the pilot using the device for briefing information, it was not clear what would be gained from recovering and accessing data from the devices.

Therefore, in consultation with the IIC, and in consideration of the limited likelihood of success, further data recovery options were not pursued.