

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

May 26, 2016

GPS and Personal Electronic Devices

**Specialist's Factual Report
by Joe Gregor**

1. EVENT

Location: Saltville, Virginia
Date: May 18, 2015
Aircraft: Beech 95-B55
Registration: N5816S
Operator: Private
NTSB Number: ERA15FA215

On May 18, 2015, at 1238 eastern daylight time, a Beech 95-B55 (T42A), N5816S, was destroyed during collision with terrain near Saltville, Virginia. The airplane departed Spruce Creek Airport (7FL6), Daytona Beach, Florida, about 0920, and was destined for Mansfield Lahm Regional Airport (MFD), Mansfield, Ohio. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the personal flight, which was conducted under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91.

2. DETAILS OF INVESTIGATION

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

Device 1: Garmin GPSMAP 496
Device 1 Serial Number: 19719707

Device 2: Apple iPad 3 (A1403)
Device 2 Serial Number: DMPJ57AVDNQV

Device 3: Apple iPad 2 (A1396)
Device 3 Serial Number: DN6GH5EFDFJ3

Device 4: Apple iPad Mini (A1454)
Device 4 Serial Number: F4KL927DF19D

2.1. Garmin GPSMAP 496 Device Description

The Garmin GPSMAP 496 is a battery-powered portable 12-channel GPS receiver with a 256-color TFT LCD display screen. The unit includes a built-in Jeppesen database and is capable of receiving XM satellite radio for flight information including NEXTRAD radar, lightning, METARs, TAFs, and TFRs. A built-in AOPA Airport Directory and Safe

Taxi 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 track log – 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 track log as a function of time or distance moved, depending on how the unit has been configured. Once the current track log memory becomes full, new information either overwrites the oldest information or recording stops, depending on how the unit is configured. The current track log can be saved to long-term memory and 15 saved track logs can be maintained in addition to the current track log. Track log 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 track log information to a PC via a built-in serial port using the NMEA 0183 version 2.0 protocol. The unit can also communicate with external devices such as a computer using a built in USB 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.

2.1.1. Garmin GPSMAP 496 Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the unit had sustained substantial impact damage. The integrated circuit that contained stored track log data was cracked and unreadable.

Figure 1. External view of the Garmin GPSMAP 495



2.1.2. Garmin GPSMAP 496 Data Description

No data was recovered from the GPSMAP 496.

2.2. Apple iPad 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 and can be accessed through manufacturer-provided interfaces.

The Apple iPad is a tablet computer with a high-resolution color touch-screen interface. All iPad devices support Wi-Fi and Bluetooth connectivity, and contain 16, 32, or 64 GB, of non-volatile memory for storage (depending on model). Some devices also support data connectivity via the 3-G and LTE cell-phone networks. The iPad implements its functionality by running programs called “Apps” capable of supporting web-browsing, email, audio/video playback, contact and calendar management, and numerous other specialized functions. User-installed Apps can be used to support functionality for electronic flight bags, flight planning and filing, aviation weather depiction, and electronic flight charts. Application data is stored in non-volatile memory and may include image, video, and position location information. Specialized application data may be stored in a proprietary file structure using numerous proprietary file formats. The amount and type of data stored varies based on the software version and configuration of the specific device.

The iPad Mini had the same functionality as the standard iPad line, with the exception of a smaller LCD screen.

2.2.1.Apple iPad 3 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had sustained catastrophic impact damage. An internal inspection revealed that the internal circuitry was damaged beyond repair.

Figure 2. External view of the Apple iPad 3



2.2.2. Apple iPad 3 Data Description

No data was recovered from the iPad 3.

2.2.3. Apple iPad 2 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had sustained substantial impact damage. An internal inspection revealed that the internal circuitry was damaged beyond repair.

Figure 4. External view of the Apple iPad 2



2.2.4. Apple iPad 2 Data Description

No data was recovered from the iPad 2.

2.2.5. Apple iPad Mini Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had sustained substantial impact damage. An internal inspection revealed that the internal circuitry was damaged beyond repair.

Figure 4. External view of the Apple iPad Mini



2.2.6. Apple iPad Mini Data Description

No data was recovered from the iPad Mini.