

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

March 18, 2013

Electronic Devices Factual Report

Specialist's Factual Report
by Bill Tuccio

1. EVENT

Location: Dover, DE
Date: January 13, 2013
Aircraft: Piper PA-28R-200
Registration: N4975S
Operator: Private
NTSB Number: ERA13LA111

On January 13, 2013, at about 1842 eastern standard time, a Piper PA-28R-200, N4975S, was substantially damaged during a forced landing following multiple attempts to land at several airports in the vicinity of Dover, Delaware. The private pilot was fatally injured and was the sole occupant of the airplane. Night instrument meteorological conditions prevailed and an instrument flight rules flight plan was filed. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91 and originated from the Kaolin Field Airport (OKZ), Sandersville, Georgia.

2. DETAILS OF DEVICE INVESTIGATION

The Safety Board's Vehicle Recorder Division received the following devices:

Device 1: Garmin GNS 430W
Device 1 Serial Number: 97118884

Device 2: Apple iPad 2
Device 2 Serial Number: DN6FPLFCDFJ3

2.1. Garmin GNS 430W Device Description

The Garmin Model GNS 430W is a panel-mounted WAAS GPS receiver featuring a 3.3-inch wide by 1.8-inch color liquid crystal (LCD) display and offering navigation and communication data, along with precision and non-precision approach certification in the IFR environment. The unit has a slot for a Jeppesen database (front-loading data card) containing all airports, VORs, NDBs, intersections, Approach, STAR/SIDs and SUA information. A flight plan composed of multiple waypoints, including user-defined waypoints, can be programmed in the unit. However, no provision has been made to record and store position information within the unit. Data related to last known

frequency settings and last known GPS location is stored in volatile memory and may be read from the front panel display upon power-up. There are no provisions for downloading stored data to a PC. 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 GNS 430W Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had sustained minor impact damage, as shown in figure 1. Power was applied to the device and it started normally, without difficulty. Screen displays were examined and documented.

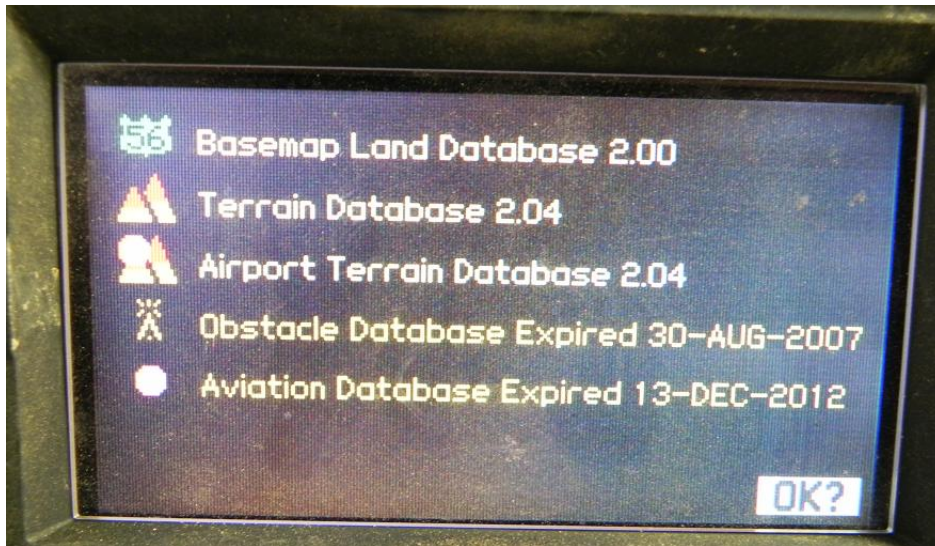
Figure 1. Garmin GNS 430W unit.



2.1.2. Garmin GNS 430W Data Description

The unit was configured to integrate with external fuel flow information and the Garmin GTX 330 traffic information service (TIS). The unit had the Garmin terrain avoidance warning system (TAWS) option installed. The installed IFRW front-loading, IFR database card expired on December 13, 2012. The TAWS front-loading, obstacle database card expired on August 30, 2007. Figure 2 shows the startup screen database information.

Figure 2. Garmin GNS 430W database expiration dates screen.



Upon startup, the instrument panel self-test screen indicated the fuel capacity of the aircraft was set to 50 gallons, and 1 gallon of fuel was on board, as shown in figure 3.

Figure 3. Garmin GNS 430W self-test screen.



The default navigation screen indicated the unit was set to "VLOC" mode. The active communication frequency was 126.350, the standby communication frequency was 131.425. The active navigational VOR/LOC frequency was 108.20; the standby navigation frequency was 111.40. The default navigation screen is shown in figure 4.

Figure 4. Garmin GNS 430 default navigation screen.



An additional front-loading IFRW card was supplied to the lab that was not installed in the Garmin GNS 430. The expiration date of the not-installed, additional, IFRW front-loading card was January 10, 2013.

2.2. Apple iPad 2 Device Description

The Apple iPad is a tablet computer with a high-resolution color touch-screen interface. All iPad devices support WiFi and Bluetooth connectivity, and use either 16, 32, or 64 GB of non-volatile memory for storage (depending on model). Some devices also support data connectivity via existing cell-phone networks. The iPad 2 and later versions also include front and back cameras. 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.

2.2.1. Apple iPad 2 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had sustained significant impact damage, as shown in figure 5. An internal inspection revealed the main processor board was not damaged, as shown in figure 6. The main processor board was installed into an NTSB surrogate unit. The surrogate unit powered on normally and the contents were examined.

Figure 5. Apple iPad 2 unit.

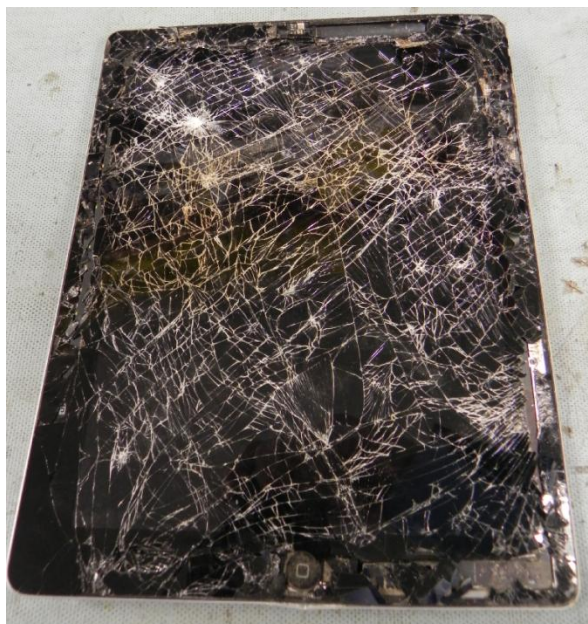
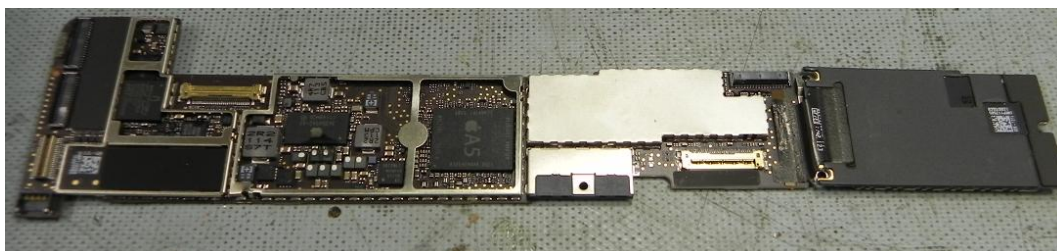


Figure 6. Apple iPad 2 main processor board removed from unit.



2.2.2. Apple iPad 2 Data Description

When powered on, the unit was configured with “airplane mode” off (that is, wi-fi and communication services were enabled). The last email activity was on January 10, 2013. There were two aviation applications installed, SkyCharts and ForeFlight.

When SkyCharts was started, it displayed the Philadelphia International Airport area. The ForeFlight airport selected was the Delaware Airpark (33N).

No other information pertinent to the investigation was found on the device.