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

October 13, 2015

Personal Electronic Device

Specialist's Factual Report
By Bill Tuccio, Ph.D.

1. EVENT SUMMARY

Location:	Orange, Virginia
Date:	March 29, 2015
Aircraft:	Piper PA-28-140
Registration:	N32396
Operator:	Private
NTSB Number:	ERA15FA170

On March 29, 2015, about 0940 eastern daylight time (EDT), a Piper PA28-140, N32396, impacted terrain after takeoff from Orange County Airport (OMH), Orange, Virginia. The student pilot was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the flight, which was destined for Farmville Regional Airport (FVX), Farmville, Virginia. The instructional flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

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:	Samsung Galaxy Tab
Serial Number:	R52F70RRT3W

3.1. Samsung Galaxy Tab Device Description

The Samsung Galaxy Tab is a tablet computer with a high-resolution color touch-screen interface with built in front and rearward facing cameras. The device supports WiFi and Bluetooth connectivity, and uses varying amounts of non-volatile memory[1] for storage

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

(depending on model). Some devices also support data connectivity via existing cell-phone networks. Specialized functions are supported by additional user-installed applications based on the Android operating system.

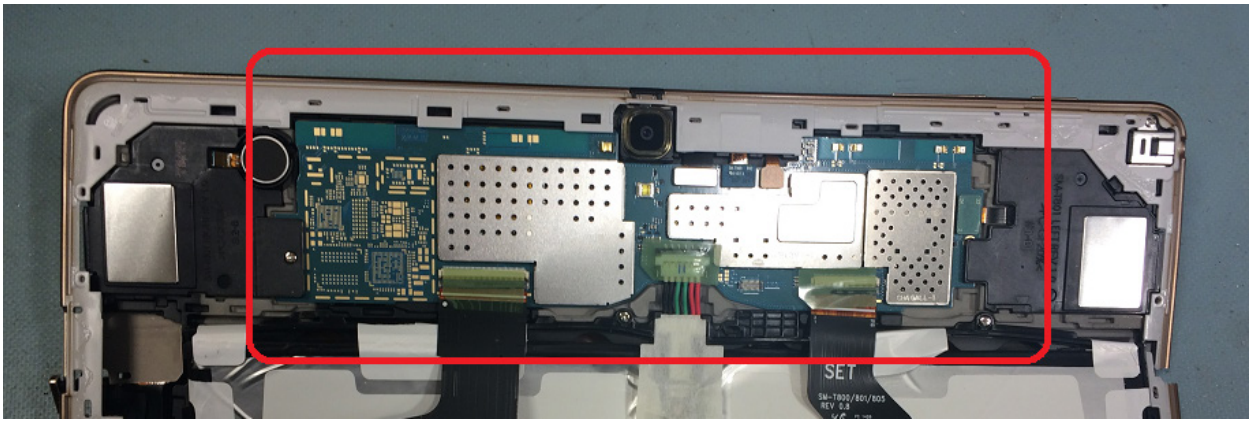
3.2. Data Recovery

Upon arrival at the NTSB Vehicle Recorder Division, an exterior examination revealed the unit had sustained significant impact damage, as shown in figures 1 and 2. An internal inspection revealed the internal component board was intact, as shown in figure 3. The internal board was placed in an operative Samsung Galaxy Tab and the unit powered on. Photos of various screens were obtained and a forensic download was performed.

Figure 1. Front of device as received.

Figure 2. Back of device as received.

Figure 3. Internal component board.



4. DEVICE INVESTIGATION

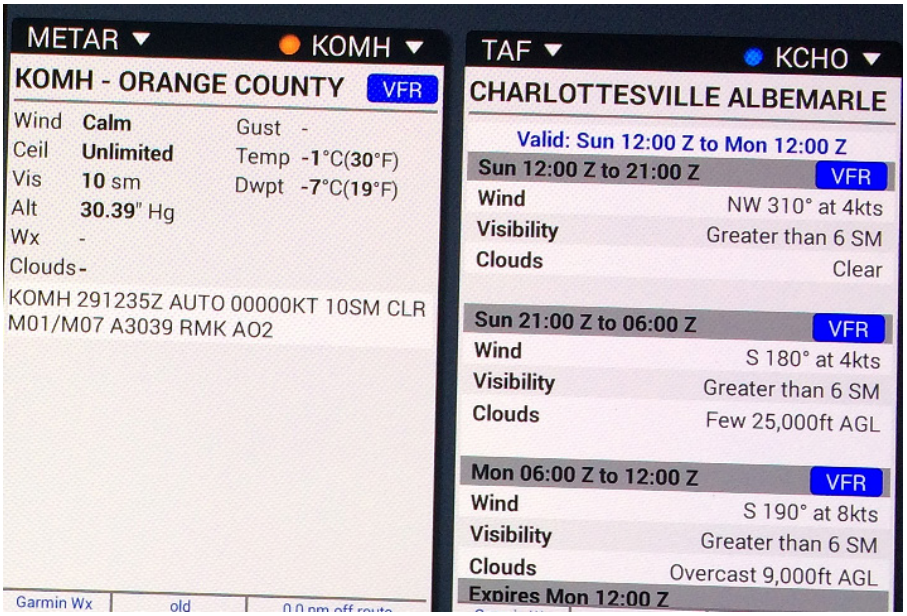
4.1. Garmin Pilot Application

The device contained a number of non-flying applications in addition to the Garmin Pilot aviation application. The Garmin Pilot application is an electronic flight bag application supporting real-time navigation, flight planning, weather display, information resources, and pilot logbook recordkeeping.

On startup, the map screen of the Garmin Pilot application showed a flight from OMH to FVX, as shown in figure 4. Weather screens in the application showed a METAR from March 29, 2015, at 1235 UTC (0835 EDT), as shown in figure 5.

Figure 4. Garmin Pilot map page.

Figure 5. Weather page in Garmin Pilot application.



4.2. Video Evidence

Two pertinent video files were retrieved from the device, both recorded on March 23, 2015. The high-definition color videos were recorded at 1920x1080 pixels, 30 frames per second, and included audio.

The filenames of the video files express times; however, the timezone of the files were not determined. The first video was taken at 1747:28 and the second at 1809:22.

No videos or photos were recovered from the accident flight.

In the descriptions that follow, times are expressed as elapsed time from the start of the video.

4.2.1. File 20150323_174728.mp4

The video lasted 21 seconds and was filmed in flight.

The video began with the camera pointing down, towards the pilot's seat, showing the pilot's feet. Throughout the 21-second video, the background sound was that of the aircraft's piston engine.

The camera panned up, showing the instrument panel, including:

- aircraft call sign placard, N32396;
- altitude of about 4,100 feet indicated;
- airspeed indicator showing about 100 knots; and
- gyroscopic heading indicator showing about a 320 degree heading.

At about 3 seconds, the camera panned outside and forward, showing clear skies and visibility greater than 20 miles, along with propeller rotation. The camera panned inside the cockpit again.

From about 11 seconds to 17 seconds, the camera panned back straight down, showing the seat between the pilot's legs. The camera then panned to the right towards the right wing; there was no passenger in the right seat.

By 20 seconds, the camera panned straight down, showing the seat between the pilot's legs.

4.2.2. File 20150323_180922.mp4

The video lasted 1 minute and 48 seconds.

The video began pointing at the top of the pilot's face and scrolled to include the pilot's entire face; the camera was in front of the pilot, facing rearward (similar to a selfie[2]).

[2] A selfie is a photograph that one has taken of oneself, typically one taken with a smartphone or webcam.

The background sound was that of the aircraft's piston engine. The aircraft roll attitude was level.

By 3 seconds, the camera moved slightly indicating the pilot was the only occupant. The pilot was wearing a headset and had a shoulder harness over his left arm.

By about 10 seconds, the camera stabilized and the pilot looked into the camera and spoke, saying "over the city," then looked out the left window as the aircraft banked slightly left. For about the next 50 seconds, the pilot looked out the left window and at the camera, speaking into the camera each time his head faced the camera (though the audio was unintelligible due to engine noise).

At about 1 minute, the roll angle was level and the pilot looked to the right and then back at the camera.

At about 1 minute and 6 seconds, the pilot looked into the camera and then blew on the camera for about 5 seconds. The pilot then spoke again while facing the camera, though the content was unintelligible due to engine noise.

The video ended as the pilot was facing into the camera.