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

October 26, 2015

Personal Electronic Devices

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

1. EVENT SUMMARY

Location:	Santa Monica, CA
Date:	September 29, 2013
Aircraft:	Cessna 525A
Registration:	N194SJ
Operator:	Private
NTSB Number:	WPR13FA430

On September 29, 2013, at 1820 Pacific daylight time, a Cessna 525A Citation, N194SJ, veered off the right side of runway 21 and collided with a hangar at the Santa Monica Municipal Airport (SMA), Santa Monica, California. The private pilot and three passengers were fatally injured, and the airplane was destroyed by a post-crash fire. The airplane was registered to CREX-MML LLC, and operated by the pilot as a 14 *Code of Federal Regulations*, Part 91 flight. Visual meteorological conditions prevailed for the flight, which operated on an instrument flight rules flight plan. The flight originated at Friedman Memorial Airport (SUN), Hailey, Idaho, about 1614.

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):

Devices with no Data Recovered

Device Manufacturer/Model:	Apple iPad 3
Serial Number:	DMPHKL9VDJ8R
Device Manufacturer/Model:	Apple iPhone 5S
Serial Number:	Unknown
Device Manufacturer/Model:	Apple iPhone 5
Serial Number:	Unknown

Devices with Data Recovered

Device Manufacturer/Model:	Apple iPhone 4
Serial Number:	C8RFP36JDDP8
Device Manufacturer/Model:	Apple iPad 2
Serial Number:	DN6G69CfDFHY

3.1. Device Descriptions

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. Apple iPhones and iPads are touch-screen operated PEDs capable of voice calling (iPhone only), text messaging, email, photo/video recording, audio (music) playback, and numerous other specialized functions depending on configuration. The unit is capable of accessing wireless networks using the IEEE 801.11n protocol (wifi) and other wireless devices supporting Bluetooth[1]. Specialized functions are supported by additional user-installed program applications (Apps). Application data is stored in non-volatile memory[2] and may include call logs, text messaging logs, image, video, and position location information. In addition, specialized application data may be stored in a proprietary file structure using numerous file formats including: binary, ASCII, HTML, SQL, etc. The amount and type of data stored varies based on the software version and configuration of the specific device.

3.2. Devices with no Data Recovered

An Apple iPad 3, Apple iPhone 5S, and Apple iPhone 5, shown in figures 1, 2, and 3, respectively, were recovered from the accident aircraft. Each of the devices had various degrees of heat, structural, and water damage. Each device was disassembled, cleaned, and repaired; however, none of the devices started sufficiently to recover any information.

[1] A short-range, low bandwidth wireless protocol used in consumer electronics used mostly for low-overhead functions.
[2] Non-volatile memory is semiconductor memory that does not require external power for data retention.

Figure 1. Apple iPad 3.

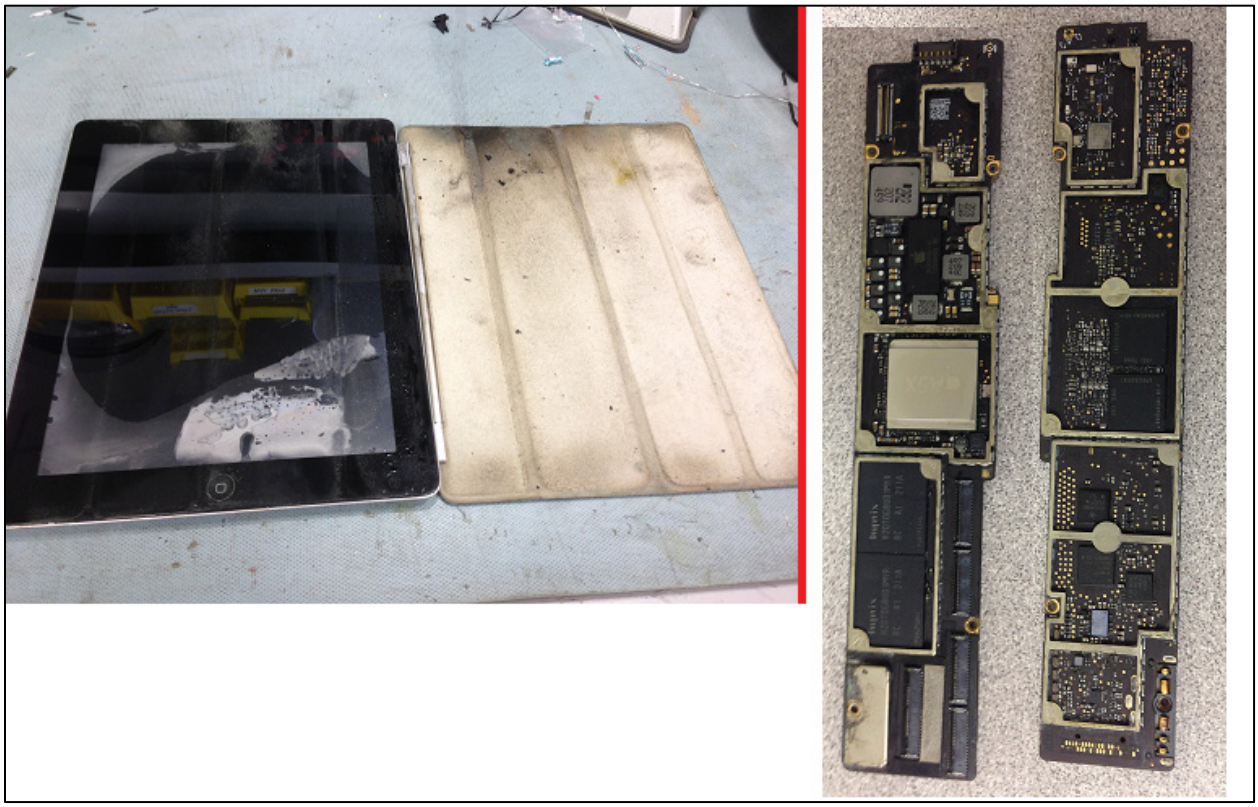
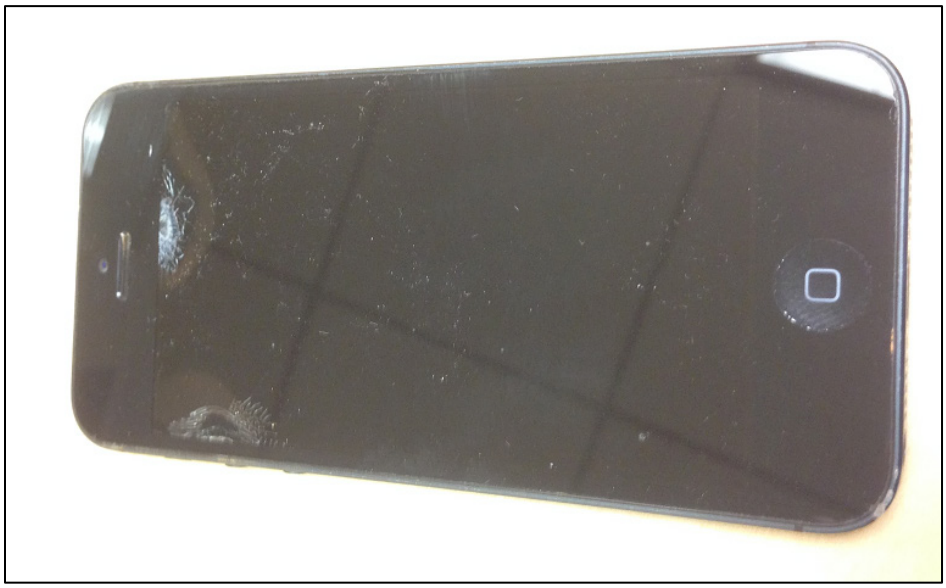


Figure 2. Apple iPhone 5S.

Figure 3. Apple iPhone 5.



3.3. Devices with Data Recovered

An Apple iPhone 4 and iPad 2 were recovered from the accident aircraft. Each device had cosmetic damage. The iPhone 4 was recovered and examined using forensic software. The iPad 2 was protected by a password, which was bypassed with assistance from the manufacturer and the contents examined.

4. DEVICE INVESTIGATIONS

Pertinent content from the Apple iPhone 4 and iPad 2 are provided as follows.

4.1. Apple iPhone 4

There was text message activity from 16:02:40 PDT to 16:16:23 PDT, including photos of the aircraft, N194SJ on the ramp; a passenger texted “Leaving the Valley.” Another text message photo was taken by a passenger showing herself in the right seat of the aircraft before departure.

A video at 16:17:56 PDT captured the takeoff from Hailey, Idaho (43.5118 N latitude, -114.3033 W longitude). The 49 second video began as the aircraft started a takeoff roll in VMC conditions and continued through the initial climb. Shortly after takeoff, an unknown person commented there may be turbulence as indicated by “ripples” in the cloud layer above.

The phone contained 14 inflight photos taken between 16:24:59 PDT and 17:23:19 PDT; summary of photo contents are shown in table 1. Position information was as reported from the photo’s metadata.

Table 1.Description of photos.

Time	Latitude Longitude	Resolved Location	Description
16:24:59 PDT	43.7452 N -116.3457 W	Eagle, ID	Camera pointed outside aircraft. Aircraft was between cloud layers.
16:35:23 PDT	42.4758 N -114.7448 W	Clover, ID	Camera pointed inside aircraft, showing center to left side of instrument panel. Altitude indicated a climb through 37,300 feet with a target altitude of 38,000 feet; aircraft was navigating to the REBRG intersection; ground track was 199 degrees; indicated airspeed was 167 knots; groundspeed was 251 knots; N-number placard was N194SJ; the anti-skid switch was in the up position (see figure 4).

16:56:54 PDT	38.8417 N -120.9893 W	Pilot Hill, CA	Camera pointed inside aircraft, towards cabin. Far front in cabin was a large, red/brown haired dog with its head pointed forward. Dog was in the aisle, with the torso forward of the rearward-facing seats. Two people were sitting aft of the dog in the forward-facing seats; a male on the left side of the plane, a female on the right. Each person had a cat in their lap. None of the three animals were restrained or caged.
16:57:01 PDT	38.8417 N, -120.9893 W	Pilot Hill, CA	Same as prior photo description.
16:58:07 PDT	No position available.	No position available.	Compared to prior photo, dog was farther forward; both cats were now on the lap of the male.
16:58:12 PDT	No position available.	No position available.	Same as prior photo description.
16:58:35 PDT	No position available.	No position available.	Same as prior photo description.
17:01:05 PDT	38.8417 N -120.9893 W	Pilot Hill, CA	Undefined light, as if camera was not properly positioned when photo was taken.
17:18:24 PDT	38.8417 N -120.9893 W	Pilot Hill, CA	Camera pointed outside aircraft, above clouds.
17:18:42 PDT	38.8417 N -120.9893 W	Pilot Hill, CA	Camera pointed outside aircraft, above clouds.
17:19:06 PDT	38.8417 N -120.9893 W	Pilot Hill, CA	Camera pointed inside aircraft, at the instruments directly in front of the right seat. Aircraft was level at 40,000 feet; indicated airspeed 205 knots; ground track was 201 degrees.
17:23:06 PDT	No position available.	No position available.	Camera pointed outside aircraft, above clouds.
17:23:13 PDT	No position available.	No position available.	Camera pointed outside aircraft, above clouds.
17:23:19 PDT	No position available.	No position available.	Camera pointed outside aircraft, above clouds.

Figure 4. Anti-skid switch.

4.2. Apple iPad 2

None of the content on the iPad 2 was from the accident flight. Pertinent photos and video were related to N194SJ. Figure 5 shows a photo of N194SJ with a red/brown haired, large dog standing in front of the aircraft.

The device contained a low-resolution, 52 second video of N194SJ taking off from the Santa Monica, California airport on an undetermined date. The video began as the aircraft started its takeoff roll. About 10 seconds into the video, the camera panned left showing the interior of the cockpit. A red/brown haired dog (the same one as in figure 5), was positioned facing forward with its nose about 18 inches aft of the throttle quadrant[3]. As the aircraft was rotating 19 seconds into the video, a person in the cockpit said, "…you want to be up front too, huh?" The camera then panned outside-right showing a row of hangars to the right of the takeoff runway. By 40 seconds into the video, the camera had panned outside, right-forward, showing the coast of the Pacific Ocean and generally clear skies in daylight conditions. As the video was ending, Santa Monica Tower directed N194SJ to contact "SoCal Departure."

[3] Though not visible, the dog's torso and hind legs would have been in the center aisle of the main cabin.

Figure 5. N194SJ with large dog in front of aircraft.