NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

July 30, 2013

Mobile Device Factual Report

Specialist's Factual Report
By Bill Tuccio

1. EVENT

Location:	Parkers Prairie, Minnesota
Date:	February 20, 2013
Aircraft:	Maule MXT-7-180, N9229Y
Operator:	Private
NTSB Number:	CEN13FA172

2. GROUP

A group was not convened.

3. SUMMARY

On February 20, 2013, about 1820 central standard time (CST), a Maule MXT-7-180, N9229Y, was substantially damaged when it impacted a snow covered field in Parkers Prairie, Minnesota. The private pilot was fatally injured. The airplane was registered to and operated by the pilot under the provisions of 14 *Code of Federal Regulations* Part 91 as business flight. Visual meteorological conditions prevailed for the flight and no flight plan was filed. The flight originated from the Greater Peoria Regional Airport (PIA), Peoria, Illinois at 1438. The intended destination was believed to be a private field in Ottertail, Minnesota. A cell phone was sent to the National Transportation Safety Board's Audio Laboratory for readout.

4. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division's Audio Laboratory received the following cell phone:

Recorder Manufacturer/Model:	**Apple iPhone 3GS**
Recorder Serial Number:	**851327DEEDG**

4.1. Apple iPhone 3GS Description

The Apple iPhone is a touch-screen operated smart-phone capable of voice calling, 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 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.

4.2. Device Damage

Upon arrival at the audio laboratory, it was evident that the iPhone had sustained significant impact damage, as shown in figure 1. The iPhone screen was removed, as shown in figure 2. The damaged screen was replaced and the unit started normally, without difficulty.

[1] A short-range, low bandwidth wireless protocol used in consumer electronics used mostly for low-overhead functions.

Figure 1. Front of Apple iPhone 3GS.

Figure 2. Internal inspection of Apple iPhone 3GS.

4.3. Timing and Correlation

Unless otherwise noted, all times are expressed as CST.

4.4. Summary of Contents

The content of various iPhone screens were examined and information downloaded using forensic software. No GPS historical information was discovered on the phone, though there was evidence an aviation application, ForeFlight (version 4.7.2), was used in flight.

Two flight plans pertinent to the accident flight were discovered. One was direct from PIA to the "Menze-Aaron" private airport, with a ForeFlight calculated distance of 430 nautical miles. The other was from PIA to ADC (Wadena Municipal Airport, Wadena, MN), with a ForeFlight calculated distance of 422 nautical miles. The ForeFlight screen for the PIA to Menze-Aaron private airport is shown in figure 3. The screen showed a course of 327 degrees magnetic, planned fuel burn of 35.9 gallons, total time enroute of 3 hours and 35 minutes, and a message "Winds aloft not included." Figure 4 shows the map display of the route in ForeFlight[2] when the unit was powered on.

A number of airport images associated with the ForeFlight application were discovered. Each image had a timestamp associated with it. All the images during the time period of the accident flight were found in the directory, "private/var/mobile/Applications/com.foreflight.ForeFlightMobile/Library/PrivateDocuments/DoNotDeleteOrBackup." The images timestamped during the period of the accident flight are shown in table 1.

During the time period of the accident flight, about 80 computer formatted weather text documents were received by the ForeFlight application. Each coded document contained weather observation and forecast data. The coded weather information seemed geographically related to the route of flight and collected as part of the automated functionality of the ForeFlight application when appropriate connectivity existed for data reception. Figure 5 shows an example of one of the coded weather messages received by ForeFlight, formatted in a binary text editor.

A transcript of all text messages found on the iPhone made on February 20, 2013 at 09:16:09 CST until the end of the text message history are shown in table 2. A list of phone calls found on the iPhone made on February 20, 2013, from 09:38:04 CST until the last successful connected call at 13:06:09 CST are shown in table 3.

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[2] The ForeFlight application was opened at the NTSB laboratories in the eastern time zone during eastern daylight time which may have affected the time displayed.

Figure 3. ForeFlight screen for PIA to Menze-Aaron private airport.

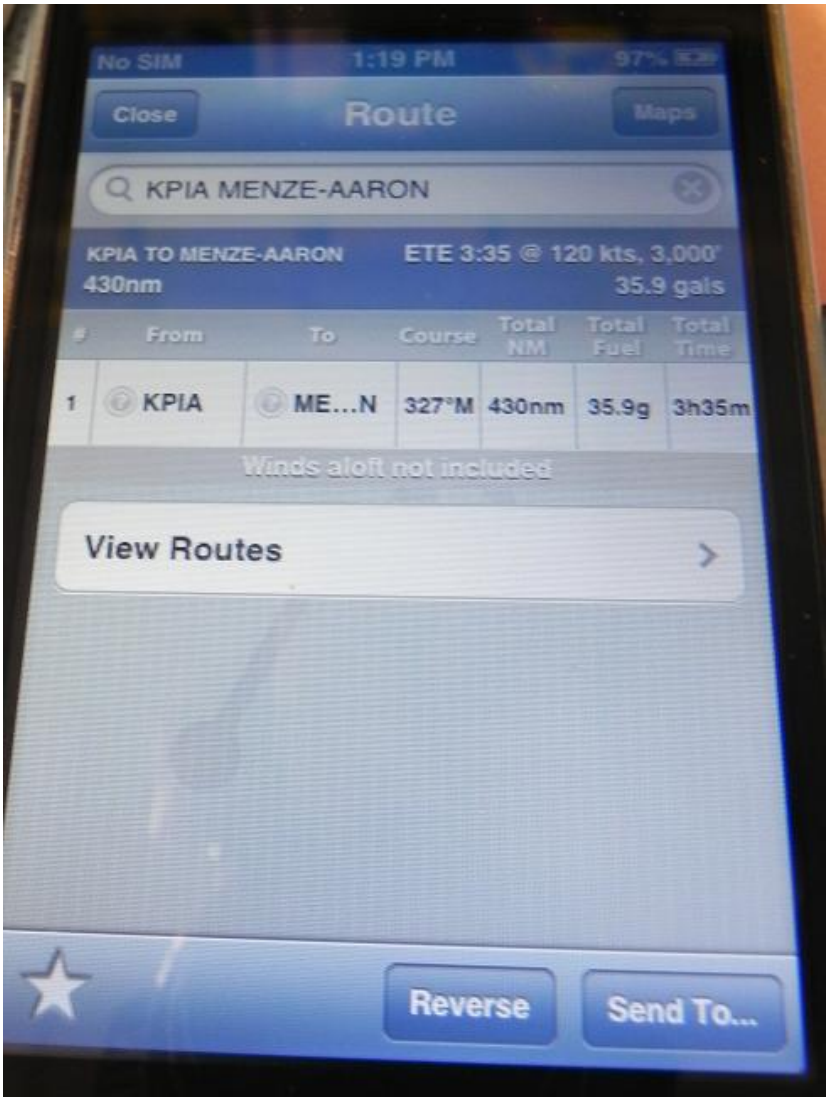


Figure 4. ForeFlight route display.

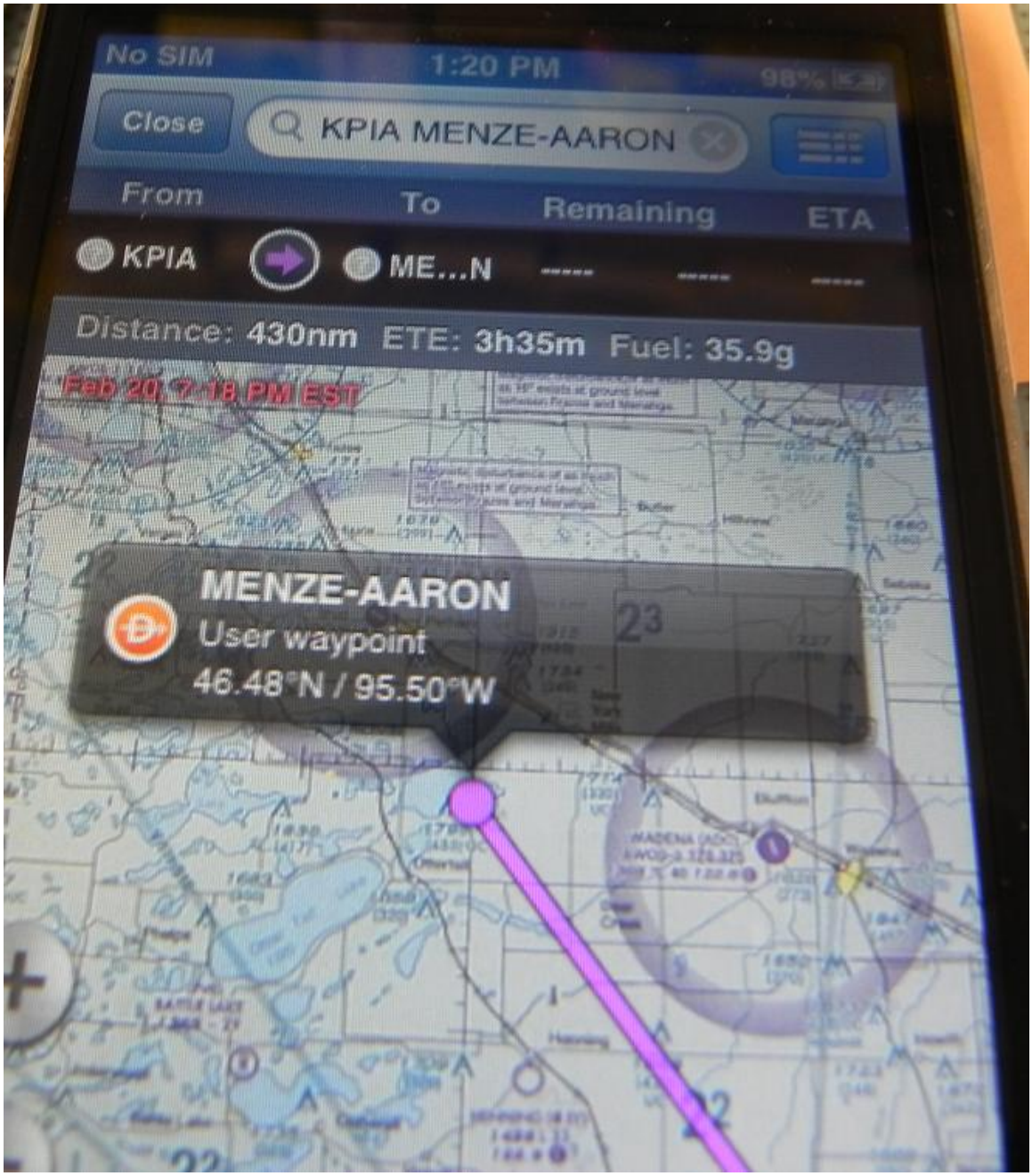


Table 1. ForeFlight airport images.

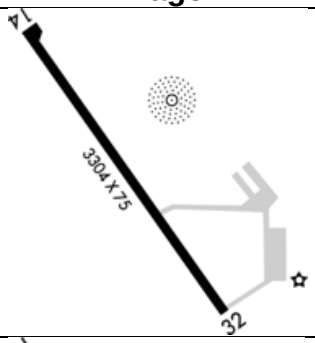
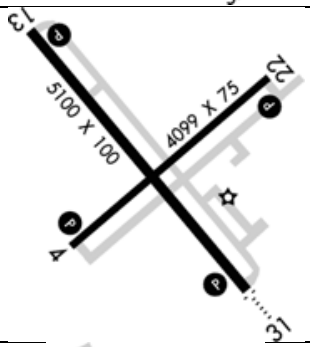
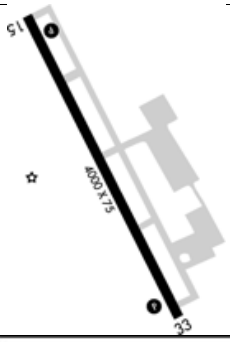
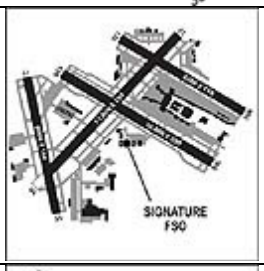
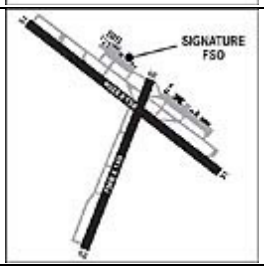
Image	Airport	Timestamp
	SAZ Staples Municipal Staples, MN	18:07:45 CST
	AXN Chandler Field Alexandria, MN	17:50:12 CST
	HCD Hutchinson Municipal Hutchinson, MN	17:19:22 CST
	MSP Minneapolis-St Paul International Minneapolis, MN	16:48:56 CST
	RST Rochester International Rochester, MN	16:44:44 CST

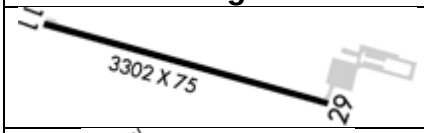
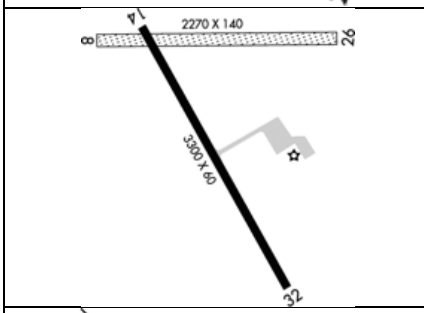
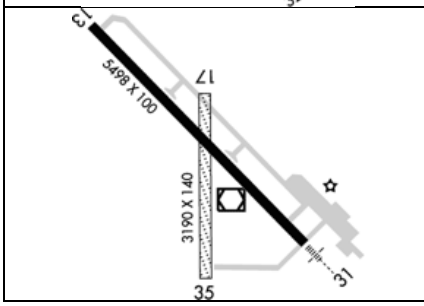
Image	Airport	Timestamp
	PEX Paynesville Municipal Paynesville, MN	16:40:40 CST
	D39 Sauk Centre Municipal Sauk Centre, MN	16:40:03 CST
	PKD Park Rapids Park Rapids, MN	16:38:10 CST

Figure 5. Sample computer formatted weather data.

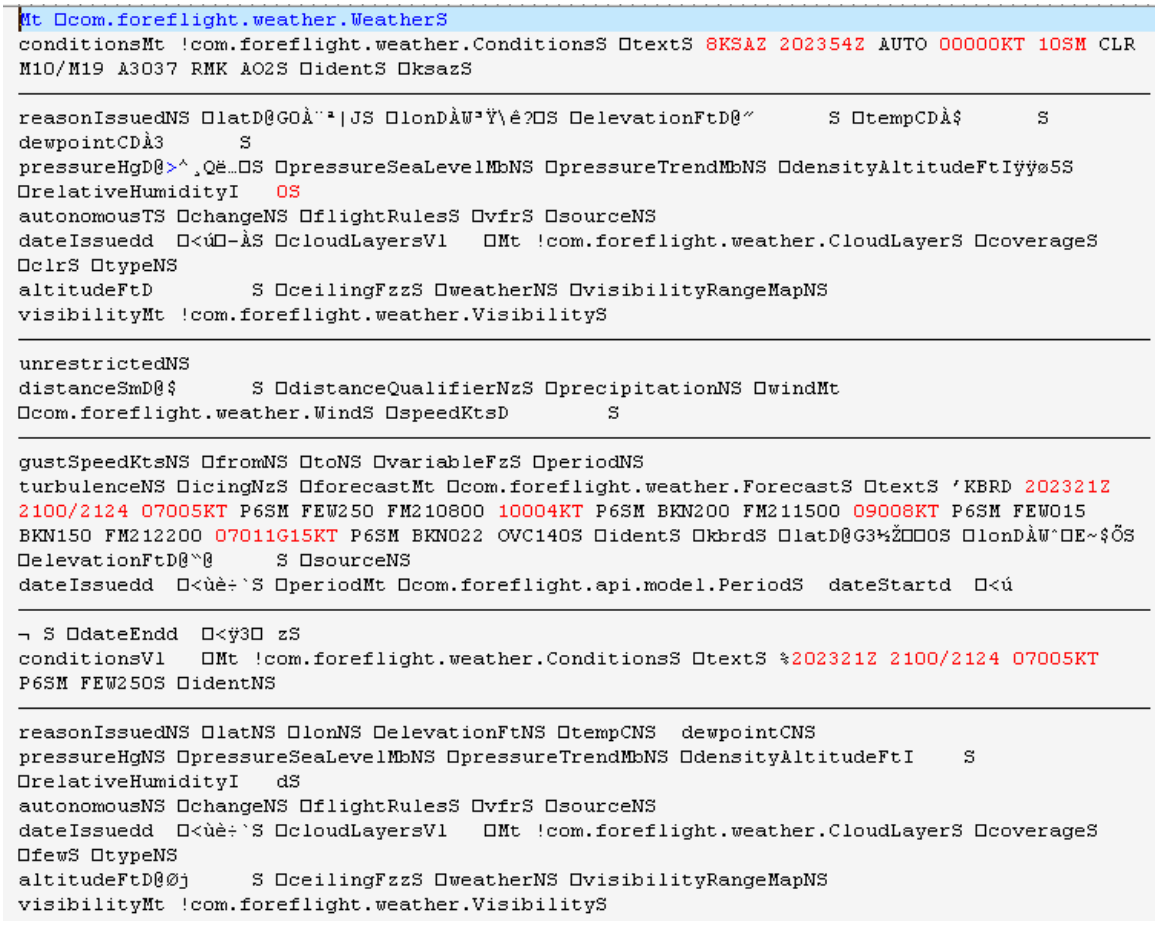


Table 2. Text message transcript.

Time	Sent/ Receive	Other Party	Text
18:05:42 CST	Sent	Pilot's Brother	Ok
18:05:22 CST	Receive	Pilot's Brother	Ya, maybe a little narrow, but should be fine
18:04:20 CST	Sent	Pilot's Brother	Is yours plowed?
18:03:50 CST	Sent	Pilot's Brother	I should be there about 6:25.
17:39:26 CST	Receive	Pilot's Brother	Dad plowed his runway if you think you can make it by dark
17:35:59 CST	Receive	Pilot's Spouse	Ok. I will tell your dad.
17:34:40 CST	Sent	Pilot's Spouse	I could be flying over home at 6:25. If it is light enough, I will land.
15:22:26 CST	Receive	Pilot's Spouse	Luv u too. Dale will pick u up
15:21:41 CST	Sent	Pilot's Spouse	I love u!
15:20:11 CST	Sent	Pilot's Spouse	Thank you!
15:18:09 CST	Receive	Pilot's Spouse	Yes
15:16:54 CST	Sent	Pilot's Spouse	Dad said he would, can you tell him?
15:15:25 CST	Receive	Pilot's Spouse	Where are you planning to land? Henning? Who is picking you up? Ok Wadena....
15:14:09 CST	Sent	Pilot's Spouse	Wadena about 7:00
15:12:37 CST[a]	Receive	Pilot's Spouse	
15:11:48 CST	Sent	Pilot's Spouse	Quad cities.
15:11:08 CST	Sent	Pilot's Spouse	On my way.
15:04:20 CST	Receive	Pilot's Spouse	Where are you now?
09:16:09 CST	Sent	Pilot's Spouse	Starter sellinoid stuck. Having fixed.

[a]Message had no content.

Table 3. Phone call log.

Time	Outbound/ Inbound	Duration	Notes
13:06:09 CST	Outbound	1 min 38 sec	Misc[a]
12:27:32 CST	Outbound	17 min 48 sec	Misc
10:47:50 CST	Outbound	0 min 26 sec	Misc
10:19:32 CST	Outbound	0 min 35 sec	Misc
10:16:31 CST	Outbound	0 min 30 sec	Family Member
10:16:08 CST	Unknown	0 min 0 sec	Disconnect
09:42:35 CST	Unknown	0 min 0 sec	Disconnect
09:38:04 CST	Outbound	1 min 6 sec	Misc

[a]Misc is other than a family member or an unknown phone number.