

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

February 27, 2018

Onboard Imaging Device

Specialist's Factual Report

By Sean Payne

1. EVENT SUMMARY

Location: Four Corners, California
Date: October 21, 2017
Aircraft: Extra 300
Registration: N414MT
Operator: California Extreme Adventures LLC.
NTSB Number: WPR18FA013

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

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

| | |
|----------------------------|-------------------------------------|
| Device Manufacturer/Model: | Garmin VIRB Elite |
| Serial Number: | O3AHGT01 |
| Media: | Unbranded 16 GB microSD Card |

3.1. Device Description

The Garmin VIRB series digital cameras are high definition, self-contained, battery-powered video and audio recorders. The units are capable of recording high definition imagery along with stereo audio information on an internal micro SD memory card. The unit is mounted in a waterproof plastic case that permits the operation of the recorder to water depths of over 100 feet. There are some slight differences in the VIRB model range in the overall resolution of the video and in the capabilities of the wireless interface, but generally the units are identical in function and operation.

3.2. Device Condition

Upon arrival at the Vehicle Recorder Laboratory, an examination revealed the unit had sustained moderate impact damage. The battery compartment was damaged and the battery was removed prior to the device being shipped to the lab. An unbranded 16 GB microSD card was removed from the device. The microSD card was visually inspected and the plastic packaging appeared to be cracked. The microSD card was X-ray examined. An xray examination revealed a crack in the packaging. From the X-ray image, it was unclear if the crack had penetrated the card's silicon die. Figure 1 is a X-ray image of the card taken at the NTSB laboratory. A detected crack is denoted with red arrows.

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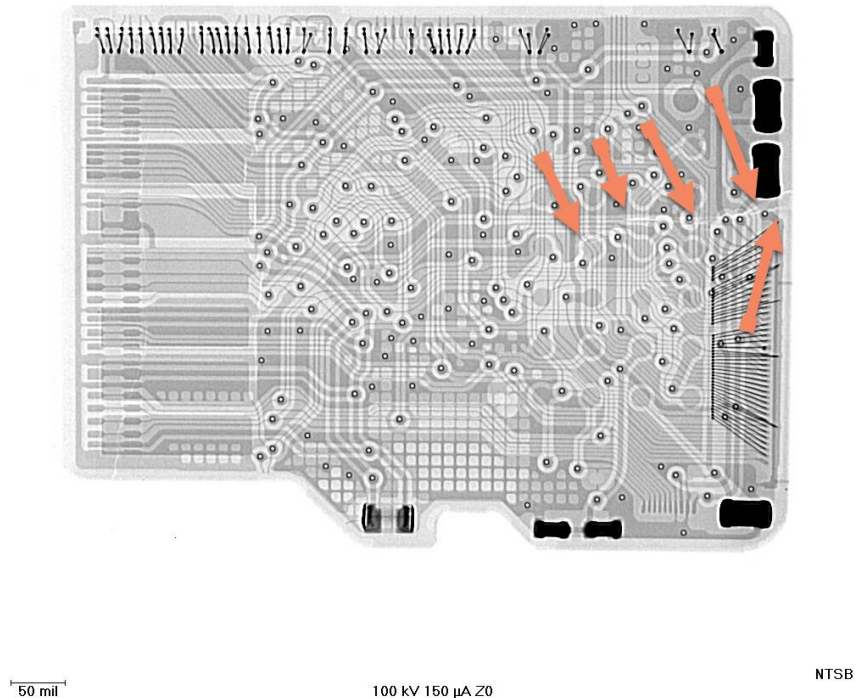


Figure 1. An x-ray image of the microSD card taken at the NTSB laboratory. Red arrows denoted a detected crack in the memory card.

When inserted into a computer, the card was unreadable.

The card was then sent to a third-party data recovery laboratory. The third-party data recovery lab was unable to get the card to function.

Upon return from the third-party data recovery lab, the card was sent to the Integrated Electronics Engineering Center (IEEC) at Binghamton University in Binghamton, New York. The IEEC laboratory evaluated the card with an acoustic microscope. The acoustic microscope uses soundwaves to produce an image of the memory card's silicon chip. The acoustic microscope evaluation showed that the card contained multiple surface

cracks as well as subsurface cracks that penetrated into the memory card's silicon die. The IEEC determined the damage to the silicon die was unreparable.

The IEEC's report is provided as attachment 1 to this report.

3.3. Data Description

No data was recovered from the device.