

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

May 1, 2019

Electronic Devices

Specialist's Factual Report By Sean Payne

1. EVENT SUMMARY

Location: Culpeper, Virginia
Date: October 12, 2018
Aircraft: Vans Aircraft RV-8
Registration: N804RL
Operator: Private
NTSB Number: ERA19FA010

2. DETAILS OF INVESTIGATION

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

Device Manufacturer/Model:	Garmin VIRB 360
Serial Number:	N/A

Device Manufacturer/Model:	Garmin SD Chart Card
Serial Number:	N/A

2.1. Device Description

Garmin VIRB

The Garmin VIRB 360 is a ruggedized, waterproof, 360-degree camera that supports up to 5.7K¹/30 FPS 16:9 format recordings and up to 4K spherical² stabilized recordings. The camera has four built in microphones to capture audio. Built in sensors provide AHRS³ like data that post-processing software uses to both stabilize the video and assist

¹ 5.7K – A video with a resolution of 5,700 horizontal lines.

² Spherical Recording – A video file consisting of imagery data typically from a set of multiple cameras, that can be rearranged via software to produce an interactive viewing experience that allows the user to look in infinite directions in 3-D space.

³ AHRS – Attitude Heading Reference System.

in creating spherical and augmented reality⁴ viewing experiences. The camera can record for about 1 hour on a single charge.

The device is also GPS capable and can record the unit's GPS position during operation. .FIT⁵ files can be exported from the device and used to overlay derived location parameters using Garmin video editing software. With additional third-party software, exporting other, AHRS-like data recorded by the camera to support spherical playback can be exploited. Some of these parameters can include, pitch, roll and yaw of the camera as well as accelerations in three axes.

Garmin SD Chart Card

The Garmin chart card is an SD card programmed to work with Garmin aviation GPS systems. These chart cards only contain chart data and do not log the unit's GPS position, or any other flight data.

2.2. Device Condition

Garmin VIRB 360

Upon arrival at the Vehicle Recorder Laboratory, an examination revealed the unit had sustained heavy impact damage. Figure 1 shows the condition of the device upon arrival to the laboratory. The door to the microSD card was opened and the microSD card was found impacted inside the camera's card slot. The camera was disassembled and the microSD card was removed. The microSD card was found to have been sheared near the rear of the card. Damage of this nature is catastrophic and the card is unable to be repaired. Additionally, the piece that was sheared off was missing. Despite this, the microSD card was arranged in such a way to fit into a microSD card reader. The microSD card was connected to a PC via this reader and the card was not recognized. Figure 2 shows the damage to the microSD card.

⁴ Augmented Reality - An interactive experience of a real-world environment where the objects that reside in the real-world are enhanced by computer-generated perceptual information.

⁵ .FIT – A GIS data file used by Garmin GPS sport devices and Garmin software



Figure 1. Photo of damaged unit



Figure 2. Photo of damaged microSD card. Notice the left side of the card is sheared off and missing.

2.3. Data Description

Garmin VIRB 360

The extent of the damage precluded normal recovery procedures and additional attempts were unsuccessful in yielding usable data. Therefore, no data pertinent to the event were recovered.

Garmin SD Chart Card

This device does not record flight data.