

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ERA23FA108

ELECTRONIC DEVICES

Specialist's Factual Report

August 10, 2023

A. ACCIDENT

Location: Dayton, Virginia
Date: January 11, 2023
Time: 1809 eastern standard time (EST)
Airplane: Piper PA-32R-301, N43156

B. ELECTRONIC DEVICES SPECIALIST

Specialist: W. Deven Chen
Electrical Engineer – Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

A recorder group was not convened. The NTSB Vehicle Recorder Division received the following electronic devices:

Manufacturer/Model:	Garmin G5
Serial Number:	4J0029429
Manufacturer/Model:	Garmin G5
Serial Number:	4J0029983
Manufacturer/Model:	Garmin GPS MAP 696
Serial Number:	1H6009865
Manufacturer/Model:	GRT Avionics Mini EFIS
Serial Number:	N/A

1.0 Garmin G5 - Description

The Garmin G5 is a digital display that can be configured as a directional gyro/horizontal situation indicator or an attitude indicator. When used in conjunction with other sensors, it can display aircraft attitude on an artificial horizon or work as a replacement heading indicator or directional gyro. The device is capable of storing flight data if there is a microSD card installed into the card slot on the front of the unit and the data logging function of the unit is enabled.

1.1 Garmin G5 - Condition and Data Recovery

The two Garmin G5 were in good condition upon arrival at the Vehicle Recorder Division, as shown in figure 1. There are no microSD cards installed on either of the two units. The devices powered on normally. Under their configuration

mode, both devices indicated the data logging function was enabled, as shown in figure 2. However, with no microSD cards installed, the accident devices did not contain flight data.

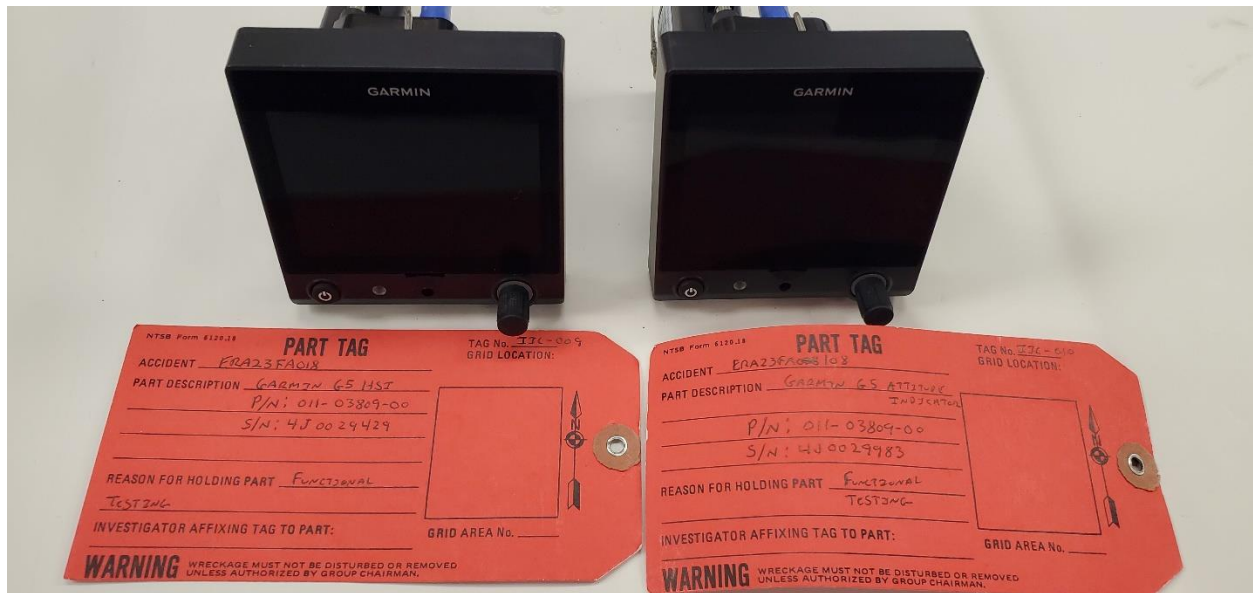


Figure 1. The two Garmin G5 as received.

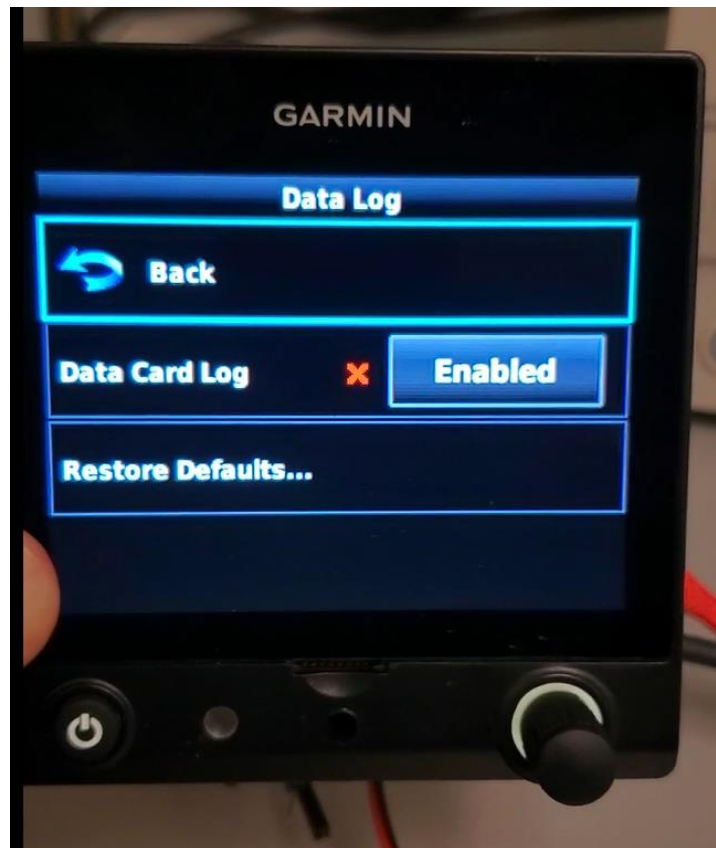


Figure 2. Data Log configuration of the Garmin G5.

2.0 Garmin GPS MAP 696 - Description

The Garmin GPSMAP 696 is a portable GPS receiver capable of storing date, route-of-flight, and flight-time information for up to 50 flights. A detailed tracklog, including latitude, longitude, date, time, and groundspeed information - is stored within the unit whenever the receiver has a lock on the GPS navigation signal. All recorded data is stored in non-volatile memory. The unit contains hardware and software permitting the download of recorded waypoint, route, and tracklog information to a PC via a built-in serial port. The unit can also communicate with external devices such as a computer using a built in USB port. An internal button-battery is used to back-up power to the internal memory and real-time clock during those periods when main power is removed.

2.1 Garmin GPS MAP 696 - Condition and Data Recovery

The Garmin GPS MAP 696 was in good condition upon arrival at the Vehicle Recorder Division, as shown in figure 3. The device powered on normally. Figure 4 shows a numerous flight logs recorded on the device; however, those flight logs were recorded between December 25, 2002, to May 28, 2003. There were no data pertinent to the accident recovered from this device.



Figure 3. Front and back of the Garmin GPS MAP 696 as received.



Figure 4. Flight Log of the Garmin GPS MAP 696.

3.0 GRT Avionics Mini EFIS - Description

The GRT Avionics Mini EFIS (electronic flight instrument system) has a 4-inch screen with softkey interface. The unit has a built-in global positioning system (GPS) and an altitude and heading reference system (AHRS). The unit comes with ARINC 429 adapter that is capable of interfacing with other avionics and navigation systems. It can be configured as a primary flight display (PFD) and display aircraft parameter data including altitude, vertical speed, airspeed, and heading. It can also be configured as an engine monitor and provide pilots with EGT, CHT, engine efficiency, and fuel consumption information. The device does not record flight data internally but is capable of recording to an external USB drive with proper configuration.

3.1 GRT Avionics Mini EFIS - Condition and Data Recovery

Upon arrival at the Vehicle Recorder Division, the GRT Avionics Mini EFIS did not show signs of damage under visual inspection, as shown in figure 5. Attached to the unit, there was a USB drive, which did not contain any flight data. This is pictured in figure 6. The unit's screen was damaged and would not display information (figure 7). A 4GB microSD card was recovered from the main circuit board of the device, shown in figure 8. This microSD card could not be mounted under a Windows

operating system. The manufacturer explained that the microSD card only contained map databases and did not contain any flight data. The manufacturer further explained that the device cannot record data internally and can only be configured to record flight data on a USB drive attached to it. Since the USB drive attached to the unit did not contain any flight data, there were no data pertinent to the accident recovered.



Figure 5. Front and back of the GRT Avionics Mini EFIS as received.

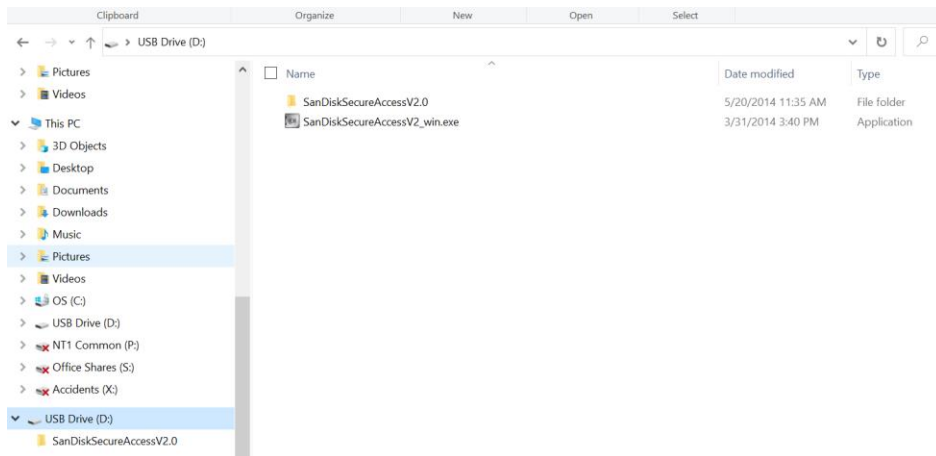


Figure 6. Contains stored under the USB drive attached to the GRT Avionics Mini EFIS.

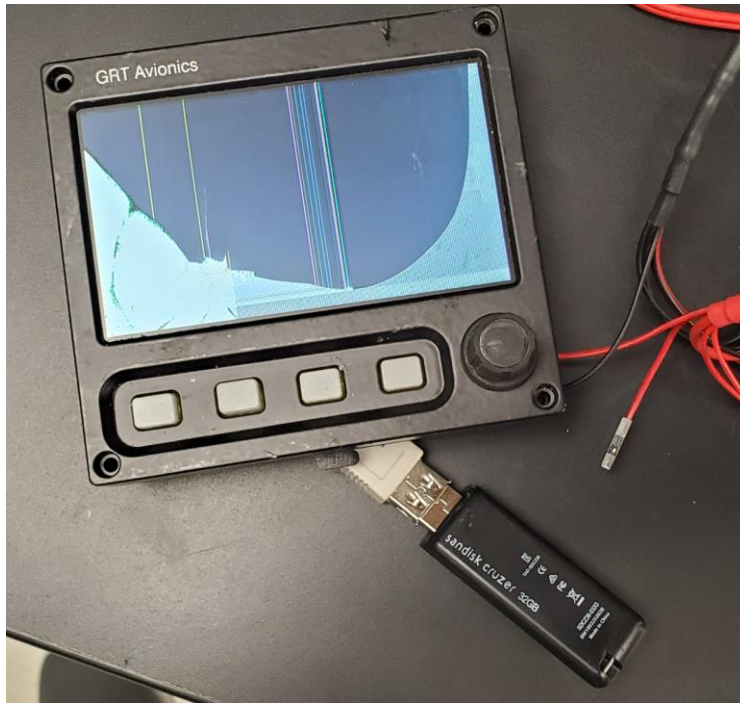


Figure 7. The display of the GRT Avionics Mini EFIS was damaged upon powering on.



Figure 8. A microSD card was recovered from the inside of the GRT Avionics Mini EFIS. The microSD card is pictured to the right of the unit, after it had been removed.

Submitted by:

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