

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

January 29, 2019

Autopilot Data

Specialist's Factual Report By Sean Payne

1. EVENT SUMMARY

Location: Glenwood Springs, Colorado
Date: September 15, 2017
Aircraft: Cirrus SR22
Registration: N462SR
Operator: Private
NTSB Number: CEN17FA354

2. DETAILS OF INVESTIGATION

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

Device Manufacturer/Model:	Avidyne Autopilot Head model DFC90
Serial Number:	Unknown (Micro SD Card Only)

2.1. Avidyne DFC-90 Digital Autopilot Device Description

The Avidyne Digital Flight Control (DFC) Autopilot is a digital, attitude-based autopilot system. The DFC90 autopilot uses the output information from the Avidyne Primary Flight Display's (PFD) ADAHRS to provide automatic aircraft control. The unit controls the aircraft in both lateral and vertical modes. The unit can also provide speed-based envelope protection.

The unit contains an internal microSD card which logs data and information related to the operation of the DFC90 device. The card logs various parameters at three different rates (low, medium, and high fidelity) depending on the type of information being recorded. System health parameters are logged at a slower rate when compared to acceleration information.

2.2. Device Condition

Upon arrival at the Vehicle Recorder Laboratory, the micro SD card was found seated in the DFC90's micro SD card chassis. Examination of the chassis revealed little to no damage. The card seated in the chassis is pictured in figure 1. The card was removed

and inspected. No visible damage was found on the memory card. The card is shown in figure 2.

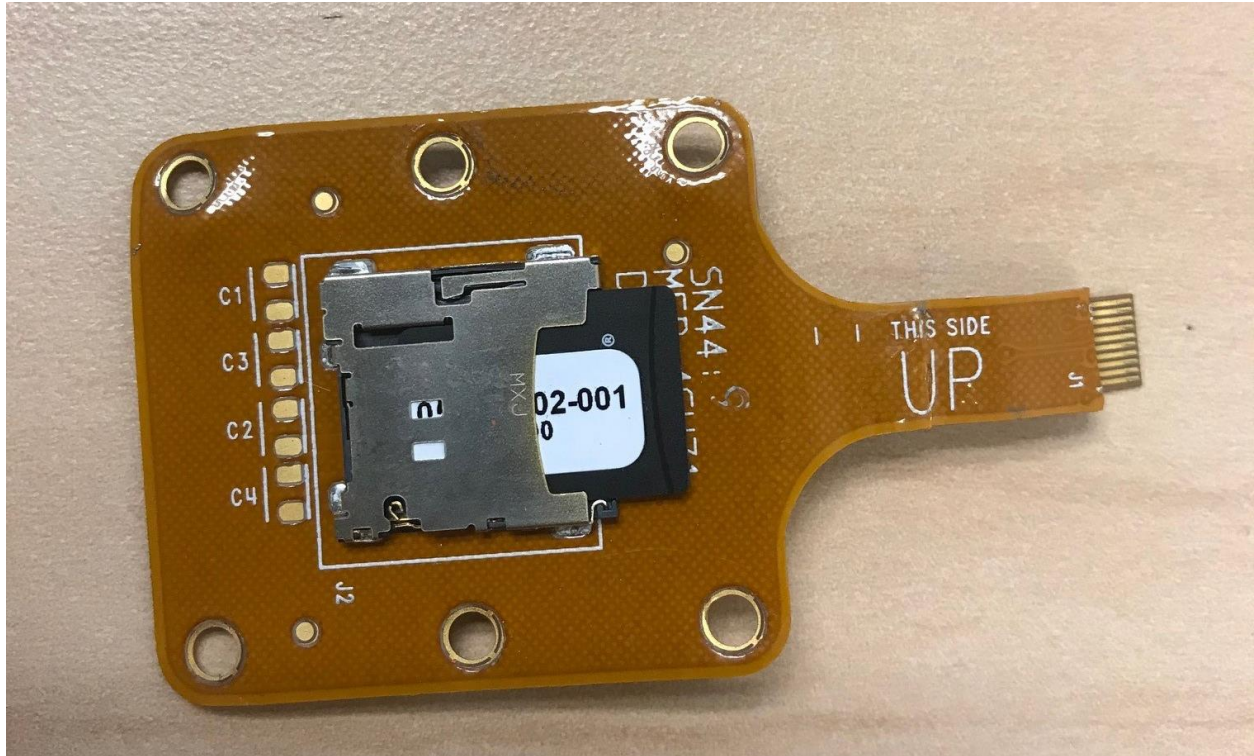


Figure 1. The micro SD card seated in the DFC90's card chassis.



Figure 2. The micro SD card removed from the card chassis.

The card was attempted to be read via PC via a forensic write blocker, which is a device that prevents accidental modification or erasure of the memory card's data. The card became hot when powered in the chassis.

The card was sent to a third-party data recovery laboratory. The third-party data recovery laboratory used a method in which the card's plastic packaging is removed via sanding to expose wire leads. Once the wire leads are exposed, it may be possible to access the card's silicon chip via a micro-soldering technique. The third-party lab removed the plastic packaging in an area of the card and determined that data would not be recoverable via the micro-soldering method. The card, with the plastic packaging removed is shown in figure 3.



Figure 3. The micro SD card with the plastic packaging removed via sanding.

A report from the third—party data recovery lab is attached to this report as attachment 1.

2.3. Data Description

This device is capable of storing data in the non-volatile memory (NVM)¹. 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.

¹ Non-volatile memory is semiconductor memory that does not require external power for data retention.