

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

August 10, 2018

Electronic Devices

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. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

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

Device Manufacturer/Model:	Avidyne MFD + Card
Serial Number:	301331227

Device Manufacturer/Model:	Heads Up Technologies RDM
Serial Number:	Unknown

3.1. Device Description

Avidyne MFD

The MFD unit is able to display the pilot checklist, terrain/map information, approach chart information and other aircraft/operational information depending on the specific configuration and options that are installed. One of the options available is a display of comprehensive engine monitoring and performance data.

Each MFD contains a compact flash (CF) memory card located in a slot on the side of the unit. This memory card contains all of the software that the MFD needs to operate.

Additionally, this card contains all of the checklist, approach charts, and map information that the unit uses to generate the various cockpit displays.

During operation, the MFD display receives information from several other units that are installed on the aircraft. Specifically, the MFD receives GPS position, time and track data from the aircraft's GPS receiver. The MFD may also receive information from the aircraft concerning altitude, engine and electrical system parameters, and outside air temperature. This data is also stored on the unit's CF memory card.

The MFD generates new data files for each MFD power-on cycle. The oldest file is dropped and replaced by a new recording once the storage limit has been reached. MFD data are sampled every six seconds and is recorded to memory once every minute. If an interruption of power occurs during the minute between MFD memory write cycles, data sampled during that portion of a minute are not recorded.

Heads Up Technologies Recoverable Data Module (RDM)

The Heads Up Technologies RDM is a crash and fire protected flight recording device. The RDM is capable of recording various flight and aircraft parameters. The device is located in the empennage in front of the rudder and receives airplane data from the primary avionics unit. Data is recorded to the RDM at 1 Hz. The RDM contains a universal serial bus connection, which can be connected to a PC to download the recorded data.

3.2. Device Condition

Avidyne MFD

Upon arrival at the Vehicle Recorder Laboratory, an examination revealed the unit had sustained damage. The extent of the damage is shown in figure 1. A compact flash (CF) card was recovered from inside the unit. The CF card is picture in figure 2. The CF card was cracked and was missing internal memory components. The internal memory components could not be found in the wreckage.



Figure 1. Photo of damaged MFD.



Figure 2. Photo of damaged CF card.

Heads Up Technologies Recoverable Data Module (RDM)

Upon arrival at the Vehicle Recorder Laboratory, an examination revealed the unit had sustained damage. The extent of the damage is shown in figure 3. The unit had sustained heavy fire damage. The RDM was exposed from the composite material and opened. Figure 4 shows the internal board of the RDM. The components on the internal board were destroyed by fire. Figure 5 shows the CF card that was recovered from the unit. The CF card has sustained heat damage. Figure 6 is an x-ray image of the CF card, component damaged is circled in yellow. Figure 7 is the CF card exposed, high temperature fire damage was prevalent. The damaged card was unable to be read using

a card reader. The design of the CF card precluded efforts to read data directly from the chip. No data was recovered from the CF card.



Figure 3. Photo of damaged RDM.

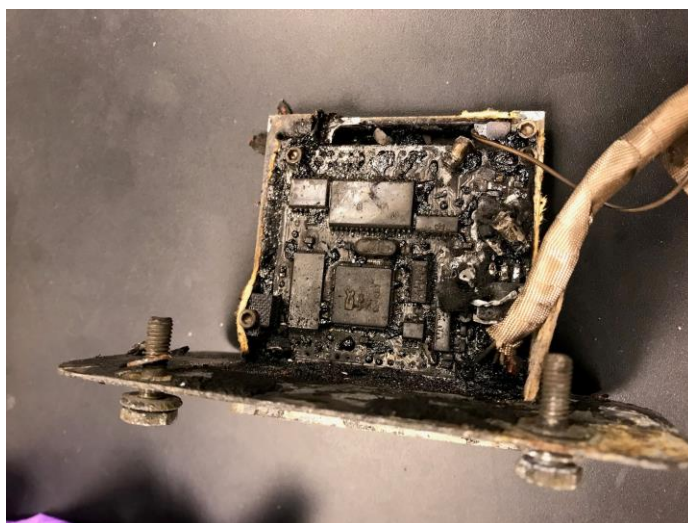


Figure 4. Photo of damaged internal board of RDM.



Figure 5. Photo of damaged CF card recovered from RDM.

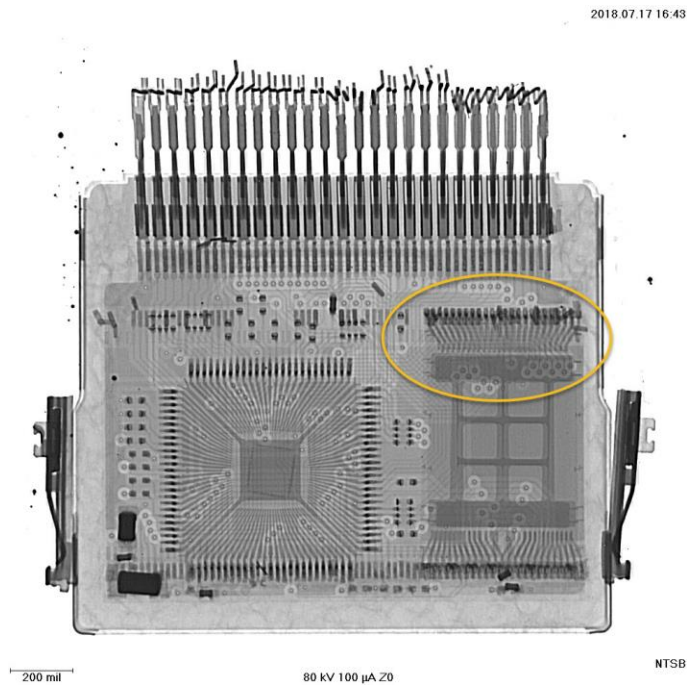


Figure 6. X-ray image of the CF card removed from RDM. Yellow circled area shows damage to NVM pins.



Figure 7. Photo of damaged CF card after being opened and inspected. Heavy fire damage was found.

3.3. Data Description

Avidyne MFD

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.

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