NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, D.C. 20594

April 6, 2020

Electronic Devices

Specialist's Factual Report
By Nick Swann

1. EVENT SUMMARY

Location:	Santa Ana, California
Date:	August 5, 2018
Aircraft:	Cessna 414
Registration:	N727RP
Operator:	Category III Aviation Corp
NTSB Number:	WPR18FA211

On August 5, 2018, about 1229 Pacific daylight time, a Cessna 414 airplane, N727RP, sustained substantial damage when it impacted the ground in a shopping mall parking lot in Santa Ana, California. The private pilot and four passengers were fatally injured. The airplane was registered to and operated by Category III Aviation Corporation under the provisions of Title 14 *Code of Federal Regulations* Part 91, as a business flight. Visual meteorological conditions prevailed, and no flight plan was filed for the cross-country flight. The flight departed Buchanan Field Airport (CCA), Concord, California, about 1022 and was destined for John Wayne-Orange County Airport (SNA), Santa Ana, California.

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:	**Shadin Fuel/Air Data Computer**
Serial Number:	**1253**
Device Manufacturer/Model:	**Avidyne EX500**
Serial Number:	**22738136**

3.1. Device Descriptions

3.1.1. Shadin Fuel/Air Data Computer Description

The Shadin Fuel/Air Data computer is a digital fuel management system designed to provide fuel management information under real-time flight conditions to the flight crew. The unit is connected to engine fuel flow transducers. The unit requires the flight crew to enter the initial fuel on board the aircraft. All calculations and data provided by the unit are based on fuel flow. According to the manufacturer, the Shadin Fuel/Air Data Computer is capable only of recording the fuel on board when powered down.

3.1.2. Avidyne EX500 Description

The Avidyne EX500 is a multi-function display. It is capable of interfacing with GPS systems, onboard weather radars, traffic information, terminal procedure charts, terrain awareness and warning system, and weather and flight restriction information with an ADS-B FIS-B receiver.

3.2. Device Conditions

3.2.1. Shadin Fuel/Air Data Computer Condition

Upon arrival at the Vehicle Recorder Laboratory, an examination revealed the unit had sustained impact damage as shown in Figure 1. The front of the device was missing.

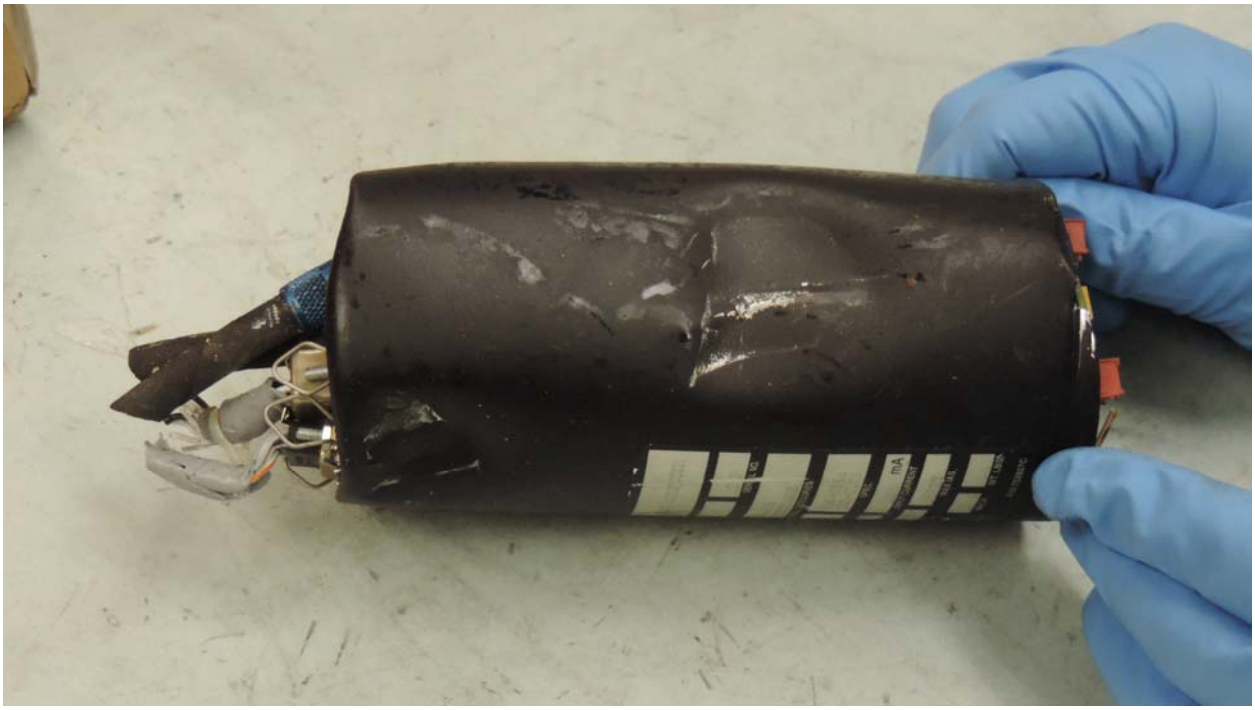

Figure 1. Damage to exterior of Shadin Fuel/Air Data Computer

3.2.2. Avidyne EX500 Condition

Upon arrival at the Vehicle Recorder Laboratory, an examination revealed the unit had sustained impact damage. The outer casing was bent, however the majority of the internal circuitry was still intact. The data from the EX500 is stored on an internally mounted Compact Flash (CF) card.

3.3. Data Descriptions

3.3.1. Shadin Fuel/Air Data Computer Data Description

The Shadin Fuel/Air Data Computer is a piece of legacy hardware. The manufacturer stated that the device possibly records the fuel on board when the unit was powered down. However, because the hardware was deemed legacy, it would require extensive work and in agreement with the Investigator-in-Charge this data point was not crucial to the investigation.

3.3.2. Avidyne EX500 Data Description

This device is capable of storing data in the non-volatile memory (NVM).[1] The EX500, however, is only designed to store the receipt of weather messages. The device does not record the message that was transmitted, only a record that the message was received. As such, it was determined that there were no data recorded on the device pertinent to the event.

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