

National Transportation Safety Board

Office of Research and Engineering

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CEN23FA220

COCKPIT DISPLAY - RECORDED FLIGHT DATA

Specialist's Factual Report

January 8, 2025

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A. ACCIDENT

Location: Gibbon, Nebraska
Date: June 2, 2023
Time: 0907 central daylight time (CDT)
Airplane: Vans RV7, private operator, N977RV

B. COCKPIT DISPLAY - RECORDED FLIGHT DATA SPECIALIST

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C. DETAILS OF THE INVESTIGATION

A group was not convened.

The NTSB Vehicle Recorder Division received the following cockpit display:

Recorder Manufacturer/Model: Advanced Flight Systems AF-2500
Part Number: 20100-
Recorder Serial Number: Unknown

1.0 Advanced Flight Systems AF-2500 Description

The Advanced Flight Systems AF-2500 is a multifunctional 6.5-inch liquid crystal display (LCD) capable of displaying both engine and aircraft data. Depending on the installation parameters monitored can include:

- Exhaust Gas Temperature (EGT)
- Cylinder Head Temperature (CHT)
- Oil Pressure and Temperature
- Manifold Pressure
- Outside Air Temperature
- Engine Revolutions per Minute
- Fuel Flow
- Carburetor Temperature
- Battery Voltage
- Bus Current

- Flap Position
- Elevator Trim Position
- Aileron Position

The unit has a fuel monitoring system that can monitor the fuel computer and fuel tank levels. The unit can also calculate, in real-time, horsepower.

The unit contains a static random-access memory (SRAM) chip for data storage. The SRAM chip is volatile after 10 years of operation in the absence of internal battery power.¹ The memory can store the last 2 hours of data at a 5 second per sample rate.

1.1 Advanced Flight Systems AF-2500 Data Recovery

The AF-2500 was damaged in the event. The extent of the damage is shown in Figure 1. The SRAM chip that stores flight logs was found separated and is shown in Figure 2. X-rays revealed the memory chip's internal circuits were undamaged.

In order to read the accident chip, extension wires were soldered to each terminal leg. After the chip was read, the binary image was copied to a surrogate chip. The surrogate chip was then brought to Advanced Flight Systems and placed into a surrogate AF-2500. A data download was completed, and the data file was analyzed. The data appeared corrupted. According to the manufacturer, corrupt data is most likely due to the data log extraction beyond the 10-year lifespan of the SRAM's internal low voltage battery. Therefore, no data pertinent to the accident were recovered.



Figure 1. Front view (left) and back view (right) of Advanced Flight Systems AF-2500, as received by the NTSB Vehicle Recorder Laboratory.

¹ The SRAM chip contains an internal lithium battery that provides energy for clock activity, and clock and random access memory (RAM) data retention when the power supply (VCC) is not present. The internal power supply can power the chip continuously for a life expectancy of 10 years at 25°C with the internal clock oscillator running in the absence of VCC power.

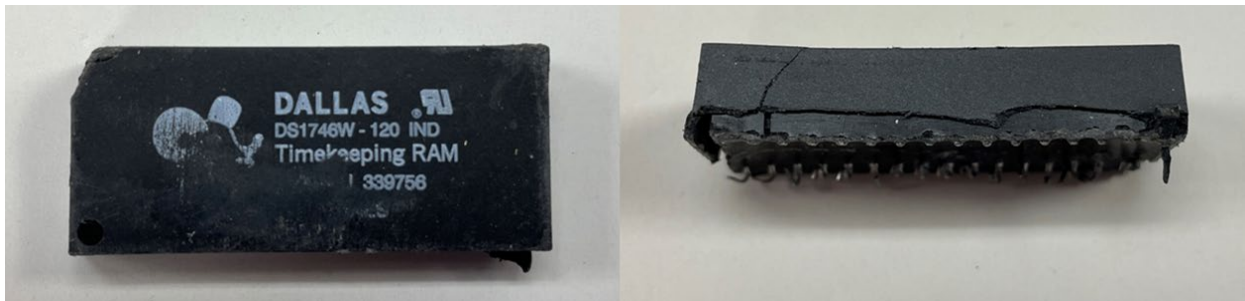


Figure 2. Top view (left) and side view (right) of the SRAM chip, as received by the NTSB Vehicle Recorder Laboratory.

Submitted by:

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