

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



CEN22LA353

ENGINE DATA MONITOR

Specialist's Factual Report

June 27, 2023

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A. ACCIDENT

Location: River Falls, Wisconsin
Date: July 29, 2022
Time: 0652 Central Daylight Time (CDT)
Airplane: Sonex Aircraft – Sonex, private operator, N1557S

B. ENGINE DATA MONITOR SPECIALIST

Specialist: Matthew Yandrick
Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

A group was not convened.

The NTSB Vehicle Recorder Division received the following engine data monitor device:

Recorder Manufacturer/Model: Electronics International MVP-50P
Recorder Serial Number: 182241

1.0 Electronics International MVP-50P Description

The Electronics International (EI) MVP-50P is a panel-mounted, color, electronic engine display allowing the operator to monitor and record parameters related to engine operations. Depending on the installation, parameters monitored may include oil pressure and temperature, outside air temperature, propeller revolutions per minute (RPM), fuel flow, fuel levels, and battery voltage and current. User customizable parameters may be defined by installation, examples include but are not limited to sensors for door states, annunciators, and flight control positions. The unit contains non-volatile memory for data storage of the parameters recorded and calculated.¹ The rate at which the data is stored is selectable by the operator. The recording function also records minimum and maximum values for each flight. The data is stored in engineering units in comma-separated value (CSV) format on an internal microSD card, using a Linux file system format. The data can be downloaded to a USB memory device via a USB port on the front of the unit or by removing the internal microSD card. Each set of recorded data is grouped by power cycle and identified by an MVP-50P assigned sequential flight number.

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

1.1 Electronics International MVP-50P Data Recovery

Figure 1 shows the device as received. An internally mounted microSD card was removed and readout normally using laboratory tools.



Figure 1. Front and back of the EI MVP-50P as received.

1.2 Electronics International MVP-50P Recording Description

Downloaded data included files recorded from July 28, 2016, through July 29, 2022 CDT. The last session started at 06:01:11 CDT and ended at 06:59:35 CDT on July 29, 2022, and contained the accident event. Data were sampled at approximately 2.78 Hz. Table 1 describes MVP-50P parameters provided and verified in this report. Not all parameters were validated by the recorder specialist.

The main fuel tank level parameter can be monitored and displayed on the device. The estimated fuel remaining is a derived parameter based on the time and fuel flow.

Table 1. Verified and provided EI MVP-50P parameters.

Parameter Name (unit)	Parameter Description
OAT (degF)	Outside Air Temperature (degrees Fahrenheit)
RPM (RPM)	Propeller Speed (revolutions per minute)
CHT #N (degF)	Cylinder Head Temperature - cylinder # (degrees Fahrenheit)
EGT #N (degF)	Exhaust Gas Temperature - cylinder # (degrees Fahrenheit)
HP (%)	Horsepower (percent)
F.FLOW (gph)	Fuel Flow (gallons per hour)
OIL P (psi)	Oil Pressure (pounds per square inch)
OIL T (degF)	Oil Temperature (degrees Fahrenheit)
F.MAIN (gal)	Main Tank Fuel Level (gallons)
EST FUEL (gal)	Estimated Fuel Remaining (gallons)
S.COOL (degF/min)	Shock Cooling Rate (degrees Fahrenheit per minute)

D. FIGURES AND TABULAR DATA

Figure 2 is a plot of parameters of the entire event flight. The time displayed is 06:00:00 to 07:00:00 CDT.

Figure 3 is a plot of parameters of the final ten minutes of the event flight. The time displayed is 06:45:00 to 06:55:00 CDT.

The corresponding tabular data used to create figures 2 to 3 are provided in electronic CSV format as attachment 1 to this report.

Submitted by:

Matthew Yandrick
Recorder Specialist

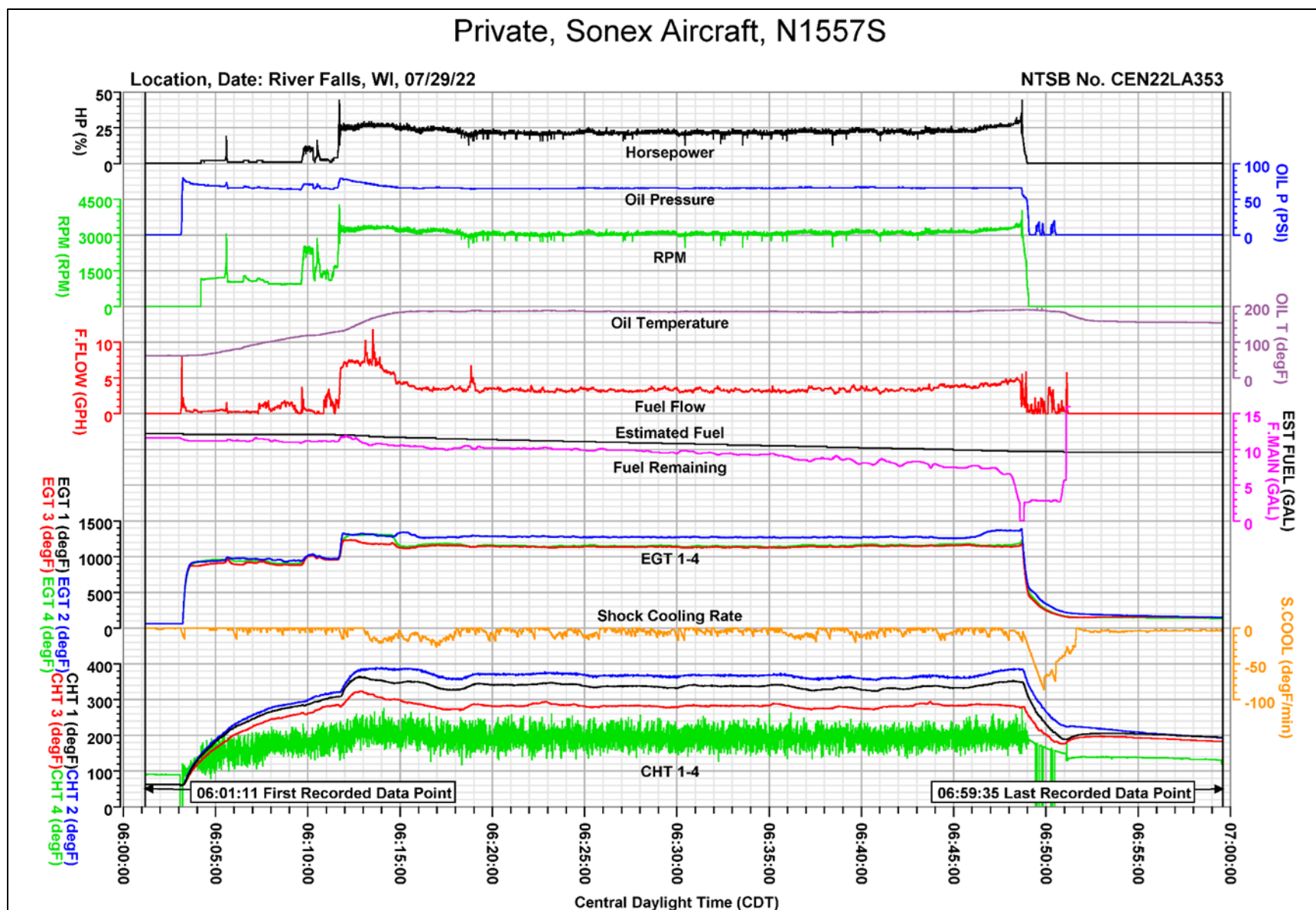


Figure 2. Plot of EI MVP-50P parameters for the entire accident flight.

Private, Sonex Aircraft, N1557S

Location, Date: River Falls, WI, 07/29/22

NTSB No. CEN22LA353

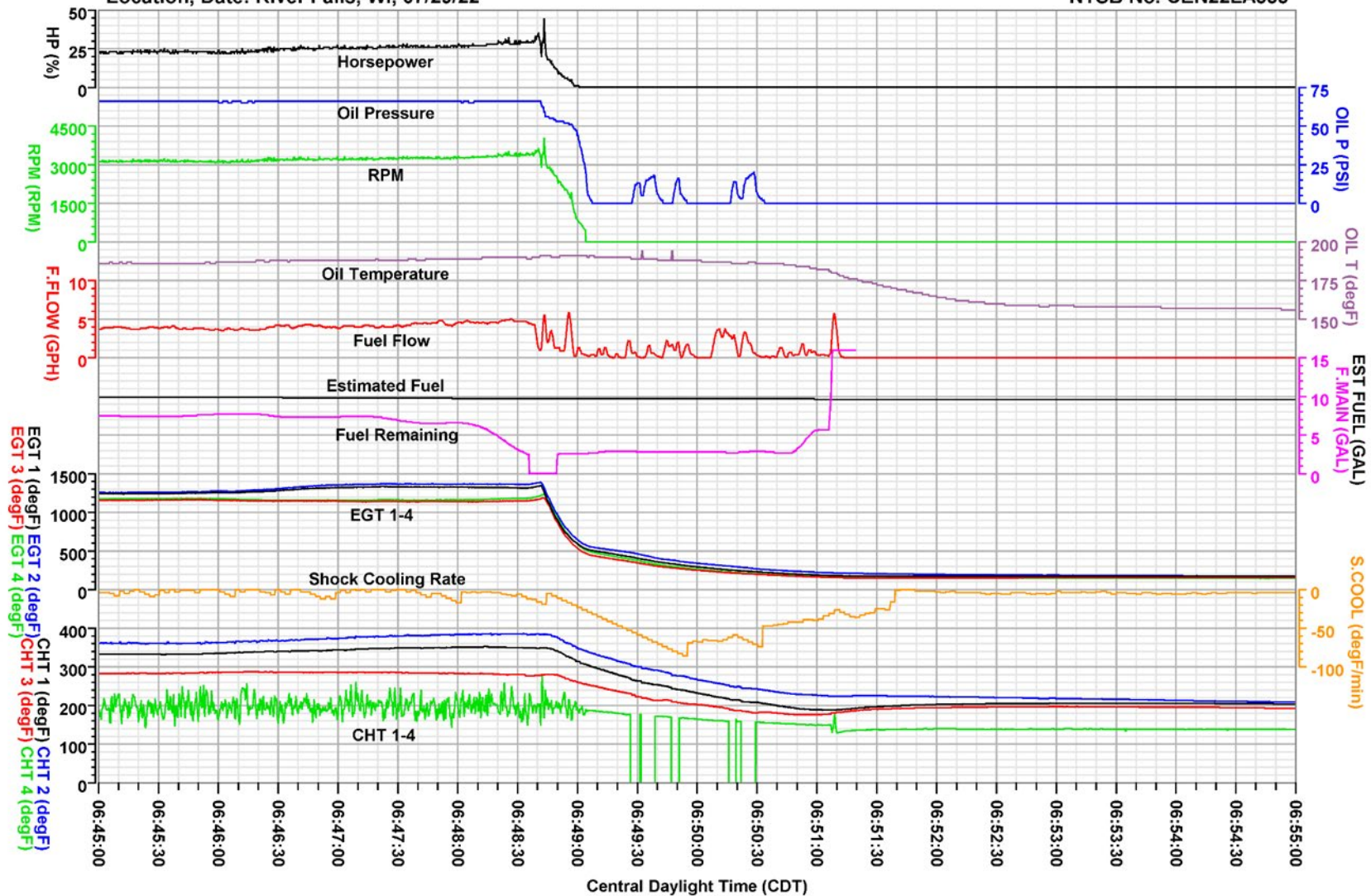


Figure 3. Plot of EI MVP-50P parameters of approximately the final 10 minutes of the accident flight.