

National Transportation Safety Board

Office of Research and Engineering

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COCKPIT DISPLAY - RECORDED FLIGHT DATA

Specialist's Factual Report

June 12, 2025

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A. ACCIDENT

Location: Methuen, Massachusetts
Date: June 17, 2024
Time: 14:15 eastern daylight time (EDT)
Airplane: Vans RV-6A, private operator, N715PA

B. COCKPIT DISPLAY - RECORDED FLIGHT DATA SPECIALIST

Specialist Charles Cates
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C. DETAILS OF THE INVESTIGATION

A recorded flight data group was not convened.

The NTSB Vehicle Recorder Division received the following electronic device:

Recorder Manufacturer/Model: Electronics International MVP-50P
Part Number: MVP-50P
Recorder Serial Number: 164788

1.0 EI MVP-50P Description

The Electronics International (EI) MVP-50P is a panel-mounted, active TFT matrix color electronic engine display that allows the operator to monitor and record parameters related to engine operations and user customizable parameters. The device is available in both a TSO'd and non-TSO'd version. Depending on the installation, engine 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 (RPM), fuel flow, fuel levels, and battery voltage and amperage. User customizable parameters may be defined by installation, examples including but not limited to sensors for door states, annunciators, and flight control positions. The unit can also calculate, in real time, percent of maximum horsepower, fuel used, shock cooling rate, and EGT differentials between highest and lowest cylinder temperatures. The calculations are also based on aircraft installation.

The unit contains non-volatile memory for data storage of the parameters recorded and calculated. 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 comma separated variable (.csv) format on an

internal SD card in a Linux file system format. If the unit is undamaged and functioning properly the csv data can be downloaded to a FAT16 USB memory device via a USB port on the front of the unit and MVP-50 built-in menu options.

1.1 EI MVP-50P Data Recovery

The MVP-50P was damaged in the event by water intrusion. The condition upon arrival at the recorder laboratory is shown in figure 1. The internal SD card removed from the internal boards is shown in figure 2. The SD card was dried and read out normally via a PC.



Figure 1. EI MVP-50P as received by the vehicle recorder laboratory.

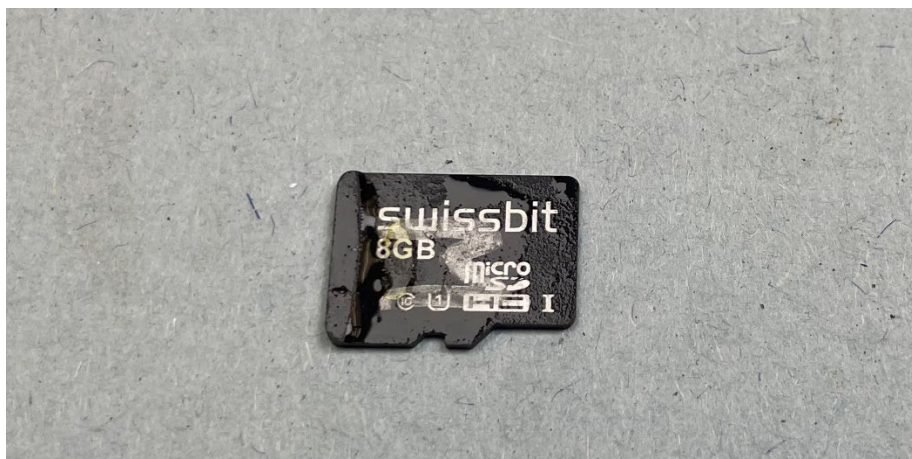


Figure 2. Internal SD card removed from MVP-50P circuit board.

1.2 EI MVP-50P Recording Description

The device recording contained records of 210 power cycles from June 1, 2021, to June 17, 2024. The accident flight was the last power cycle recorded. The duration of the accident flight recording was approximately 20 minutes.

1.2.1 EI MVP-50P Engineering Unit Conversions

Data recorded by the MVP-50 was written in standard engineering units within the csv file. No additional unit conversions were necessary.

Where applicable, changes to the conversions have been made to ensure the parameters conform to the Safety Board's standard sign convention that climbing right turns are positive (CRT=+).¹

Appendix A lists the EI MVP-50P parameters verified and provided in this report.

1.3 EI MVP-50P Time Correlation

MVP-50P data were recorded in local eastern daylight time from an internal clock set by the pilot. No other time correlation was necessary.

D. FIGURES AND TABULAR DATA

Figures 3 to 4 contain data recorded during the event on June 17, 2024. All the parameters listed in table 1 are plotted.

Both figures show the data from the time the recorded powered on prior to the accident flight until the data ended. Figure 3 primarily shows engine parameters and Figure 4 shows other recorded parameters.

These figures are configured such that right turns are indicated by the trace moving toward the bottom of the page, left turns towards the top of the page, and nose up attitudes towards the top of the page.

In summary, the recording indicated the airplane had 18.6 gallons of fuel in the left tank and the right tank was empty. A review of previous power cycles showed the fuel levels were valid. The engine was advanced to takeoff power at 14:14:38 EDT, and the aircraft took off and began to climb. At 14:15:08 EDT, with GPS altitude at 352 feet (about 200 feet above ground level) and airspeed at 116 knots, fuel pressure

¹ CRT=+ means that for any parameter recorded that indicates a climb or a right turn, the sign for that value is positive. Also, for any parameter recorded that indicates an action or deflection, if it induces a climb or right turn, the value is positive. Examples: Right Roll = +, Left Aileron Trailing Edge Down = -, Right Aileron Trailing Edge Up = +, Pitch Up = +, Elevator Trailing Edge Up = +, Right Rudder = +.

began to decrease to 0 psi. The aircraft continued to climb, and at 14:15:36 EDT, engine RPM, oil pressure, and EGT² began to fluctuate and decrease. The aircraft continued to climb with decreasing airspeed, and the recording ended at 14:16:01 EDT. Final data showed the aircraft at 1824 feet GPS altitude and an airspeed of 73 knots.

The corresponding tabular data used to create figures 3 to 4 are provided in electronic comma separated value (CSV) format as attachment 1 to this report.

Submitted by:

Charles Cates
Mechanical Engineer/Recorder Specialist

² Only EGT 2 and EGT 4 were valid in the recording. EGT 1 and EGT 3 were invalid for all of the recorded data and were not plotted.

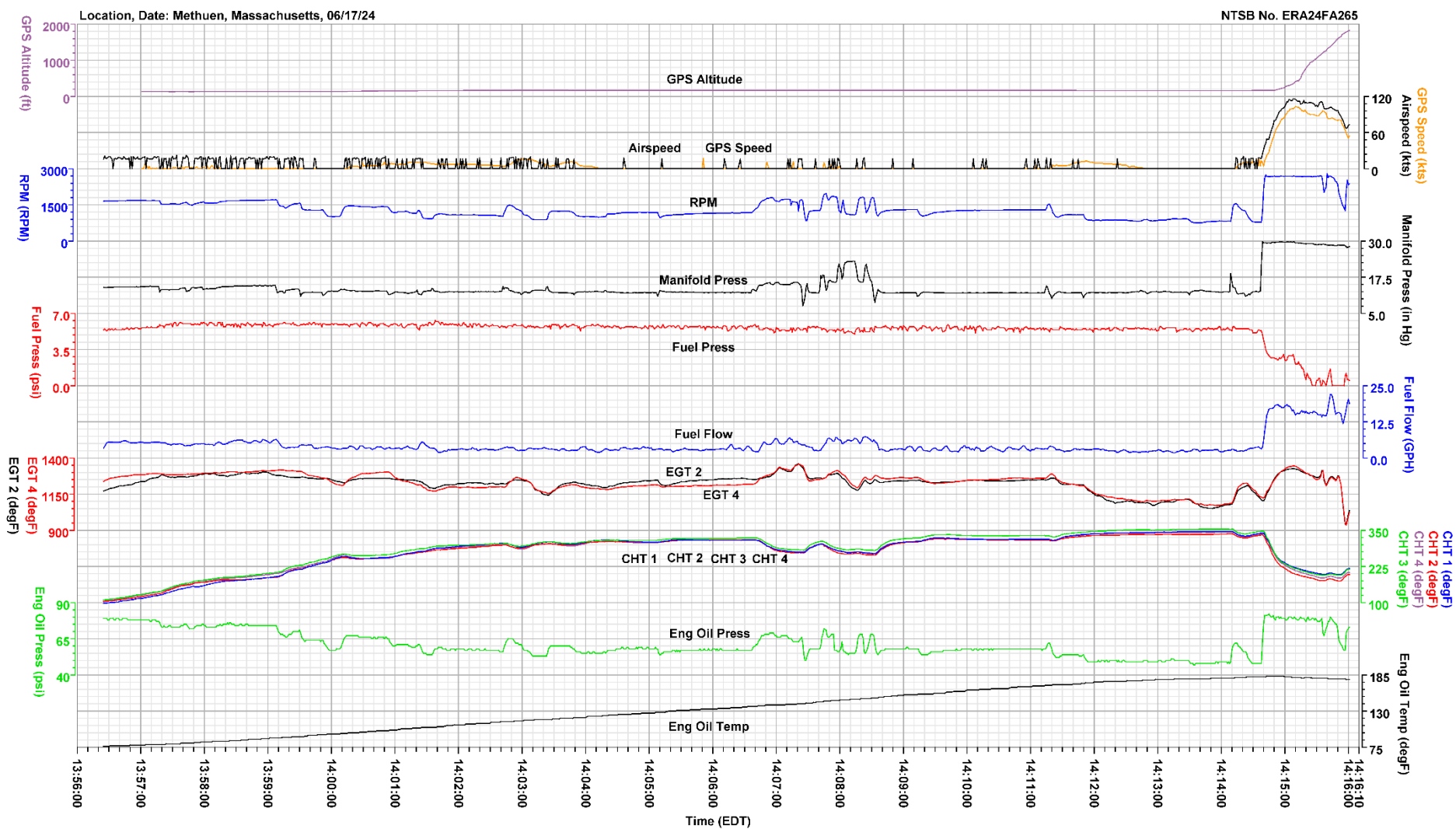


Figure 3. Plot of recorded data from EI MVP-50P.

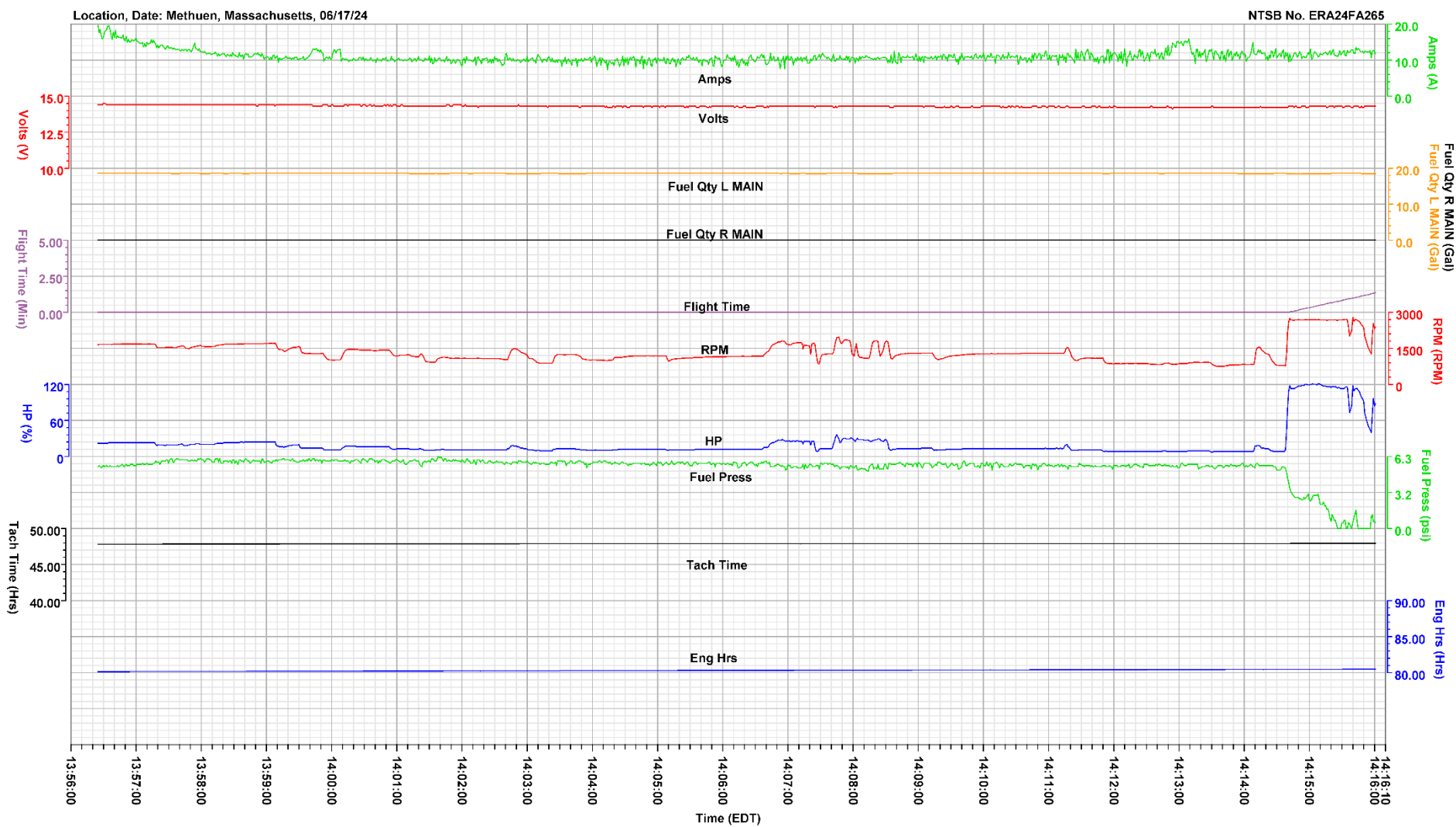


Figure 4. Plot of recorded data from EI MVP-50P.

APPENDIX A. VERIFIED AND PROVIDED PARAMETERS

This appendix describes the parameters provided and verified in this report. Table 1 lists the MVP-50P parameters and table 2 describes the unit abbreviations used in this report.

Table 1. Verified and provided parameters

Parameter Name (units)	Parameter Description
Airspeed (kts)	Indicated Airspeed
Amps (A)	Aircraft electrical system amperage
CHT # (degF)	Cylinder head temperature cylinder #
EGT # (degF)	Exhaust gas temperature cylinder #
Eng Hrs (hrs)	Engine time
Eng Oil Press (psi)	Engine oil pressure
Eng Oil Temp (degF)	Engine oil temperature
Flight time (min)	Duration of current flight
Fuel Flow (gph)	Fuel flow
Fuel Press (psi)	Fuel pressure
Fuel Qty L MAIN (gal)	Left main fuel tank quantity
Fuel Qty R MAIN (gal)	Right main fuel tank quantity
GPS Altitude (ft)	GPS-calculated altitude
GPS Speed (kts)	GPS-calculated speed
HP (%)	Estimated engine horsepower
Manifold Press (in Hg)	Engine manifold pressure
RPM (rpm)	Engine RPM
Tach Time (hrs)	Aircraft tach time
Volts (V)	Aircraft electrical system voltage

Table 2. Unit abbreviations

Unit Abbreviation	Description
A	Amperes
degF	degrees Fahrenheit
ft	feet
gal	gallons
gph	gallons per hour
hrs	hours
in Hg	inches of Mercury
kts	knots
psi	pounds per square inch
rpm	revolutions per minute
V	Volts