

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

December 22, 2020

Engine Data Monitor (EDM)

Specialist's Factual Report
By Gerald Kawamoto

1. EVENT SUMMARY

Location: Grand Canyon, Arizona
Date: August 28, 2020
Aircraft: Cessna TU206
Registration: N3422L
Operator: Private
NTSB Number: WPR20LA291

2. ENGINE DATA MONITOR GROUP

An Engine Data Monitor (EDM) group was not convened.

3. DETAILS OF INVESTIGATION

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

Recorder Manufacturer/Model: **JPI EDM-830**
Recorder Serial Number: **38584**

3.1. JPI EDM-830 Description

The J. P. Instruments EDM-830 is a panel mounted LCD display that the operator can monitor and record up to 24 parameters related to engine operations. 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, Turbine inlet Temperature, Engine Revolutions per Minute, Compressor Discharge Temperature, Fuel Flow, Carburetor Temperature, and Battery Voltage.

The unit can also calculate, in real-time, horsepower, fuel used, shock cooling rate and EGT differentials between the highest and lowest cylinder temperatures. The calculations are also based on the 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 from 2 to 500 seconds per sample. The memory can store up to 20 hours of data at a 6 second sample rate. For a non-damaged unit, the data can be downloaded by using a USB flash drive and following the instructions on the unit.

3.1.1. Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an external examination revealed the recorder was in good condition, as shown in Figure 1, and the data were extracted normally using laboratory tools.

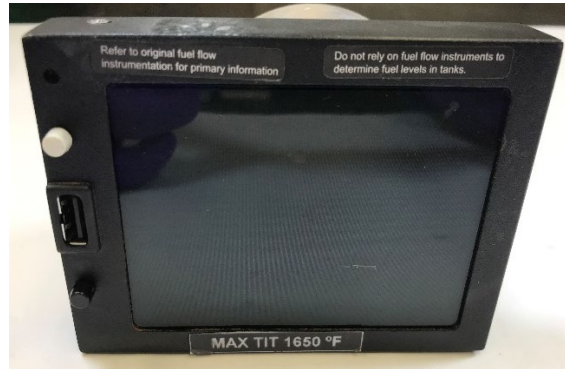


Figure 1. JPI EDM-830 as received.

3.1.2. Data Description

The EDM contained 71 sessions recorded from May 20, 2020, through August 28, 2020. The EDM records time with the first data sample based on the unit's internal clock. This clock is set and updated by the operator. The time on the device was found to be approximately 31 minutes offset from Mountain Standard Time (MST) and the offset was applied to data included in this report. The accident flight was determined to be the last session recorded on August 28, 2020, and started at 10:30:30 and ended at 10:53:53 Correlated MST. The data were sampled at one sample per second.

The engineering units conversions used for the data contained in this report are based on documentation from the manufacturer of the EDM.

3.2. Plots and Corresponding Tabular Data

The following two figures contain EDM data recorded during the August 28, 2020, accident event.

Upon review of past sessions recorded, values of CHT 2 and EGT 5 were intermittently recorded on the device. The values of the parameters mostly trended with their respective CHT and EGT values when data were recorded.

Figure 2 is a plot of JPI parameters for the entire accident flight. The time interval displayed is 10:30:00 to 10:55:00 Correlated MST.

Figure 3 is a plot of JPI parameters for the last seven minutes of the accident flight. The time interval displayed is 10:47:00 to 10:54:00 Correlated MST.

The corresponding tabular data used to create these two plots are provided in electronic (*.csv¹) format as Attachment 1 to this report.

¹ Comma Separated Value format.

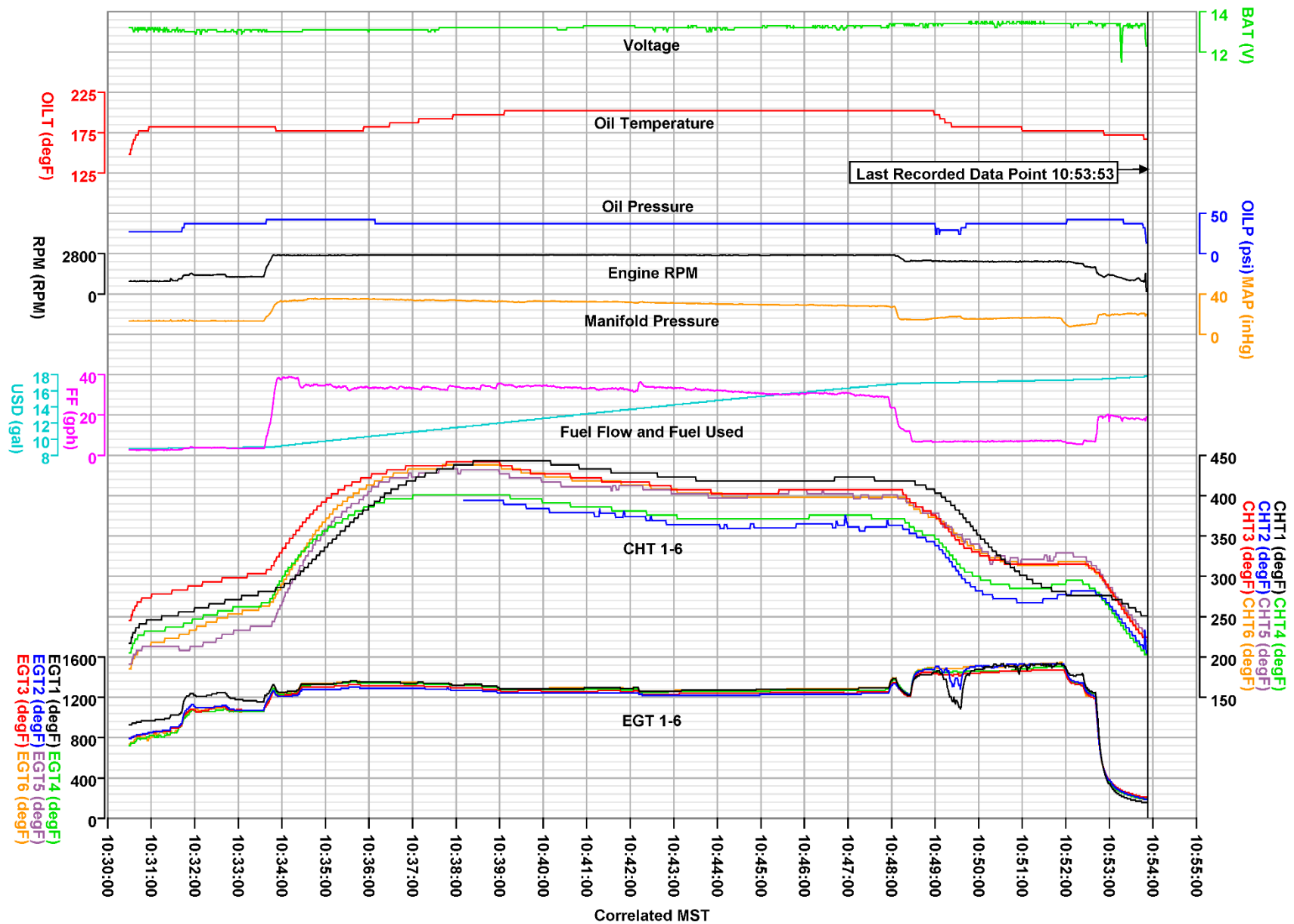


Figure 2. Plot of JPI parameters for the entire accident flight.

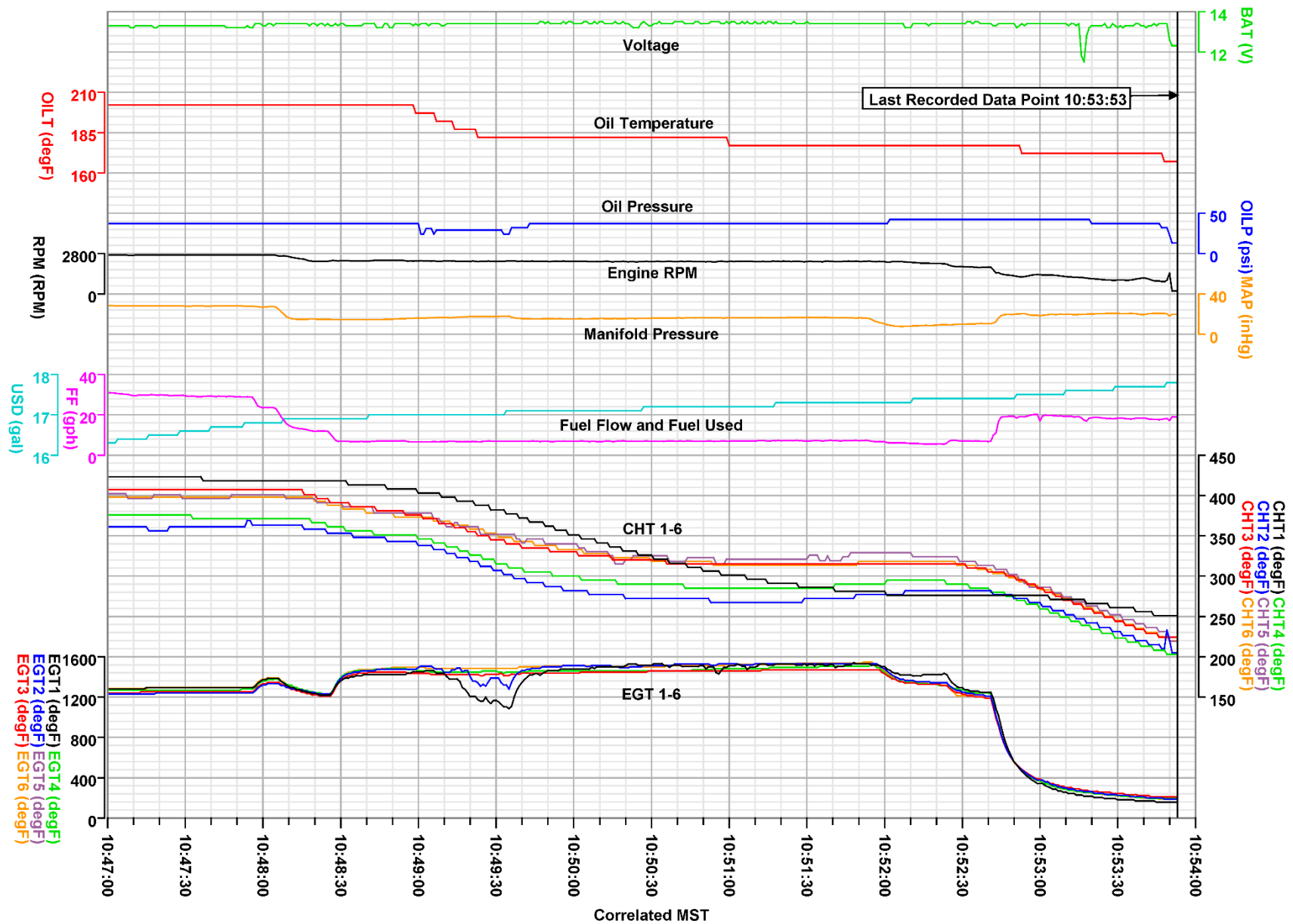


Figure 3. Plot of JPI parameters at the end of the accident flight.