

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

April 9, 2020

Engine Data Monitor

Specialist's Factual Report

By W. Deven Chen

1. EVENT SUMMARY

Location: Ellensburg, Washington
Date: January 17, 2019
Aircraft: Piper PA23-250
Registration: N14372
Operator: Private
NTSB Number: WPR19LA066

On January 17, 2019, about 1645 Pacific standard time, a Piper PA23-250 airplane, N14372, impacted the ground near Ellensburg, Washington. The commercial pilot was fatally injured, and the airplane was destroyed. The airplane was registered to and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions existed at the accident site about the time of the accident, and no flight plan had been filed. The flight originated from Bowers Field Airport (ELN), Ellensburg, Washington about 1631 and was destined for McAllister Field Airport (YKM), Yakima, Washington.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

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

Device Manufacturer/Model:	JPI EDM-960 Display Unit
Serial Number:	04977
Device Manufacturer/Model:	JPI EDM-960 Data Acquisition Unit #1
Serial Number:	04976
Device Manufacturer/Model:	JPI EDM-960 Data Acquisition Unit #2
Serial Number:	N/A

3.1. JPI EDM-960 Description

The JPI EDM-960 is a twin-engine monitor instrument with one display unit and one Data Acquisition Unit (DAU) per engine. The color display unit allows the operator to 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 (RPM), Compressor Discharge Temperature, Fuel Flow, Carburetor Temperature, and Battery Voltage etc..

The instrument can also calculate in real time, percent of maximum horsepower, fuel used, shock cooling rate, engine hours (Hobbs time) and EGT differentials between highest and lowest cylinder temperatures. The calculations are also based on the aircraft installation.

The instrument includes a GPS interface to any GPS device.

The instrument contains non-volatile memory¹ 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 60 seconds per sample. The memory can store up to 800 hours of data at a 6 second-per-sample rate. The data can then be downloaded by the operator using the J.P. Instruments software.

3.2. JPI EDM-960 Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the instrument had severe damage from the accident, as shown in Figures 1 and 2. Figure 3 shows two memory devices the lab received along with the JPI EDM-960. One of the memory devices was a Garmin SD card and the other one was a JPI Instrument memory module. After consulting with the manufacturer, it was determined that both memory devices were dislodged from the JPI EDM-960 display unit in the accident and that the JPI memory module would be where the flight data was stored. The NVM of the memory module was removed from the damaged circuit board. A raw-data binary readout was obtain using laboratory tools. However, the raw-data decoding process could not yield engineering unit data. It was determined that the NVM itself had damage. The extent of the damage precluded normal and advanced recovery procedures and additional attempts were unsuccessful in yielding usable data. Therefore, no data pertinent to the event were recovered.

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

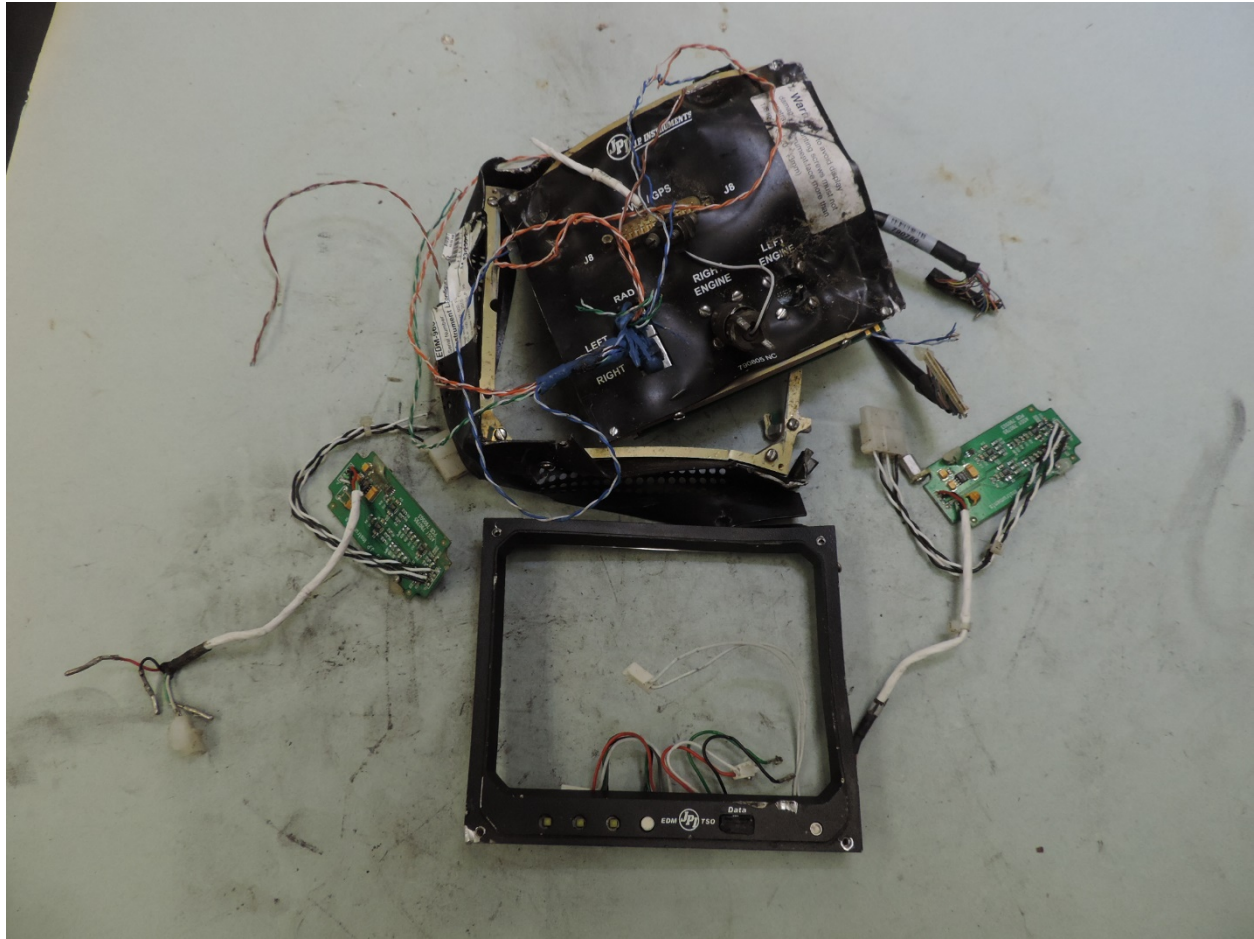


Figure 1: JPI EDM-960 Display Unit as received.

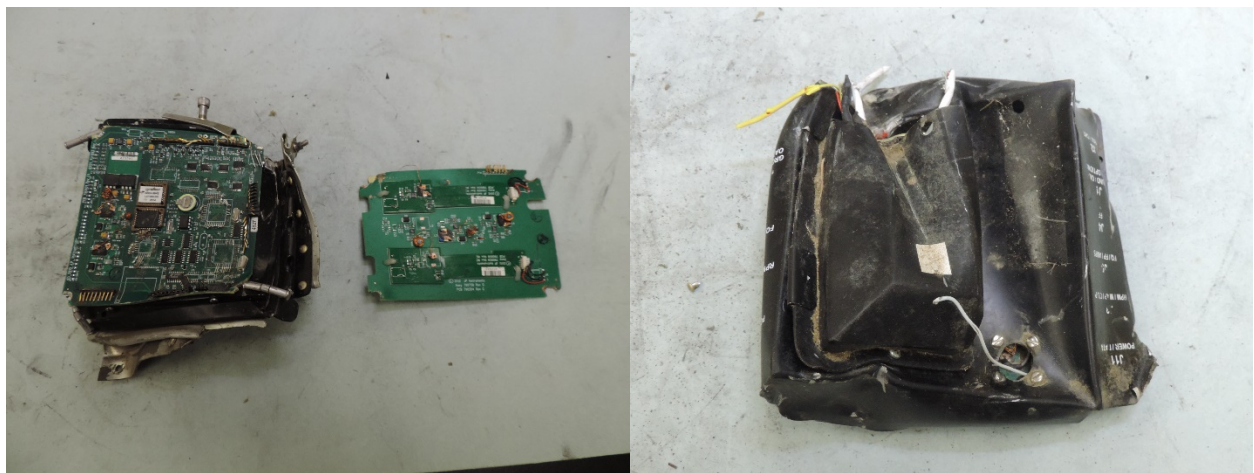


Figure 2: JPI EDM-960 DAU #1 and DAU #2 as received.



Figure 3: Front and back of memory devices as received.