

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

January 30, 2017

Engine Data Monitor (EDM)

Specialist's Factual Report
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1. EVENT SUMMARY

Location: Llano, California
Date: August 27, 2015
Aircraft: Piper PA-25-260
Registration: N4369Y
Operator: Southern California Soaring Academy
NTSB Number: WPR15FA250

On August 27, 2015, at 1206 Pacific daylight time (PDT), a Piper PA-25-260, N4369Y (call sign "Red Tow"), collided with terrain during the landing approach to Crystal Airport, Llano, California. The airplane was registered to, and operated by, Southern California Soaring Academy (SCSA), Inc., and was being utilized for glider tow operations under the provisions of 14 *Code of Federal Regulations* Part 91. The airline transport pilot was fatally injured, and the airplane sustained substantial damage during the accident sequence. The local flight departed at 1150 PDT. Visual meteorological conditions prevailed, and no flight plan had been filed.

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-700**
Recorder Serial Number: **15835**

3.1. JPI EDM-700 Description

The J. P. Instruments EDM-700 is a panel-mounted gauge used to monitor and record parameters related to engine operation. Data can be recorded to non-volatile memory¹, at a rate selectable by the operator, and downloaded using software provided by J.P. Instruments.

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

3.1.1. Data Recovery

The recorder was damaged in the accident, preventing subsequent normal operation and data download capability from the device. The extent of the damage is shown in figures 1 through 3. Data was recovered by removing the appropriate memory chips from the circuit board assembly, and decoding the raw data that was stored on the chips.

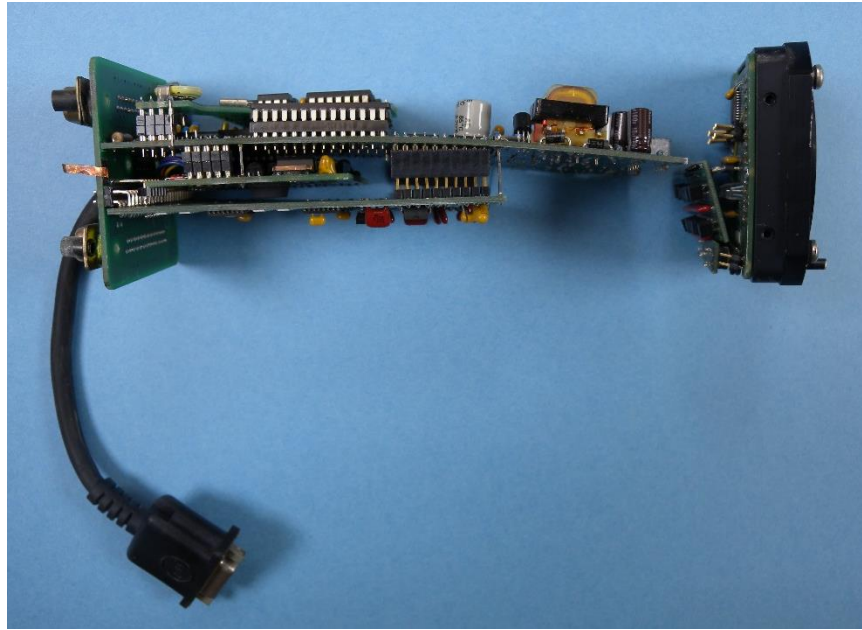
Figure 1. Damaged exterior of device, front view.



Figure 2. Damaged exterior of device, side view.



Figure 3. Damaged interior of device, side view.



3.1.2. Data Description

The EDM recording contained engine data from flights beginning August 22, 2015. The event flight was the last flight of the recording.

3.1.3. Engineering Units Conversions

The engineering units conversions used for the data contained in this report are based on documentation from the manufacturer of the EDM. Table 1 lists the EDM parameters verified and provided in this report.

3.2. Time Correlation

The EDM records time based on the unit's internal clock. Date and time is set by the user, and is not slaved to an external time source. By comparing EDM data to airplane flight records from the days leading up to, and including, the accident flight, the EDM time was determined to be approximately 12 hours ahead of PDT². Tabular data and plots provided in this report reference PDT.

3.3. Plots and Corresponding Tabular Data

Figure 4 shows engine data recorded during the flights conducted on August 27, 2015, beginning about 1020 PDT. Annotations indicate the cumulative flight count for the day; the accident occurred at the end of the seventh flight. The corresponding tabular data used to create the plot are provided in electronic (*.csv) format as attachment 1 to this report.

² A precise time offset could not be determined with the available records; data provided in this report is considered to be within 5 minutes of PDT.

Table 1. JPI EDM-700 parameters

Parameter Name	Parameter Description	Units
TIME	Date and Time	PDT
BAT	Battery Voltage	Volts DC
EGT # *	Exhaust Gas Temperature, Cylinder # *	deg F
CHT # *	Cylinder Head Temperature, Cylinder # *	deg F
CLD	Engine Shock Cooling Rate	deg F / min

** Depending on aircraft configuration, number of cylinders that are instrumented varies.
In the data, '#' is replaced with the appropriate cylinder ID.*

Figure 4. Plot of engine parameters.

