

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

March 5, 2014

Engine Data Monitor (EDM)

Specialist's Factual Report

By James Cash

1. EVENT SUMMARY

Location: Mountainaire, Arizona
Date: May 28, 2013
Aircraft: Hawker Beechcraft A36
Registration: N999PK
Operator: Private
NTSB Number: WPR13FA244

On May 28, 2013, about 1143 Mountain Standard Time, a Beechcraft A36, N999PK, was destroyed when it impacted trees and terrain in the Coconino National Forest adjacent to Mountainaire, Arizona, shortly after takeoff from Flagstaff Pulliam airport (FLG), Flagstaff, Arizona. A large post-impact fire ensued immediately. The owner/private pilot and the one passenger received fatal injuries. No persons on the ground were injured or killed. The personal flight was operated under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the flight.

2. ENGINE DATA MONITOR GROUP

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

3. DETAILS OF ENGINE DATA MONITOR INVESTIGATION

The Safety Board's Vehicle Recorder Division received the following EDM:

Recorder Manufacturer/Model: **JPI EDM-700**
Recorder Serial Number: Unknown

3.1. JPI EDM-700 Description

The J. P. Instruments EDM-700 is a panel mounted gauge 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
- 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. The data can then be downloaded by the operator using the J.P. Instruments software.

3.1.1. Recorder Condition

The recorder was seriously damaged by the post-crash fire. The extent of the damage to the unit is shown in figure 1. The memory module is shown in figure 2. Normally there are 4 memory chips located on the upper circuit card of the unit. In addition to the 4 memory chips, there is one additional memory chip located on the main processor board. Because of the fire, only 2 of the 4 chips remained on the upper board and the 1 chip on the main board was completely burned away. As a result of the extensive fire and heat damage, no data was able to be extracted from the 2 remaining memory chips.

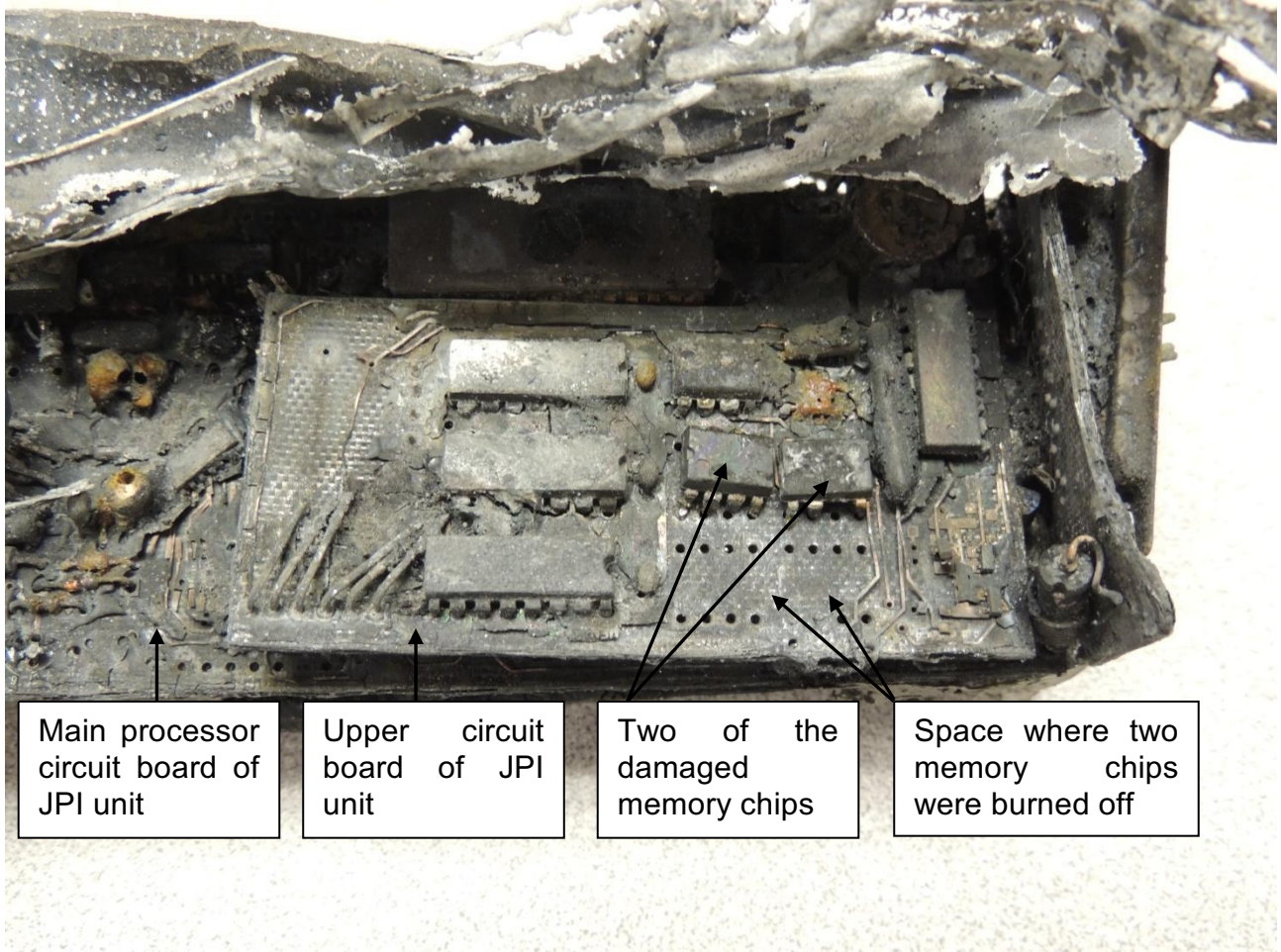
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Figure 1. Fire damage to exterior of JPI device.



Figure 2. Fire damage to interior circuit card of JPI device.



Main processor circuit board of JPI unit

Upper circuit board of JPI unit

Two of the damaged memory chips

Space where two memory chips were burned off