

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

October 31, 2018

Non-Volatile Memory (NVM) Devices

**Specialist's Factual Report
by Joe Gregor**

1. EVENT

Location: Chesterfield, Missouri
Date: December 06, 2017
Aircraft: Beech B36
Registration: N679EA
Operator: Private
NTSB Number: CEN18FA049

On December 6, 2017, at 1454 central standard time, a Raytheon Aircraft Company B36TC airplane, N679EA, impacted a gas station pump canopy and parking lot following a reported loss of engine power while on visual approach to the Spirit of St. Louis Airport (SUS), Chesterfield, Missouri. The airplane was registered to Wings West, LLC, Las Vegas, Nevada, and operated by a private individual as a 14 *Code of Federal Regulations* Part 91 personal flight. Day visual meteorological conditions prevailed at the time of the accident, and the flight was conducted on an instrument rules flight plan. The flight departed the Phoenix Deer Valley Airport (DVT), Phoenix, Arizona, at 0926, and was destined for SUS.

2. DETAILS OF INVESTIGATION

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

Device 1: JPI EDM-730/830
Device 1 Serial Number: 34125

Device 2: Garmin GDU-620
Device 2 Serial Number: Unknown

2.1. JPI EDM-730/830 Device Description

The J. P. Instruments EDM-730/830 is a panel mounted LCD display unit 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 two to 500 seconds per sample. The memory can store up to 20 hours of data at a six second sample rate. For a non-damaged unit, the data can then be downloaded by the operator using a USB flash drive and following the instructions on the unit.

2.1.1. JPI EDM-730/830 Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the unit had sustained significant heat and fire damage (see figure 1). The EDM-730 stores data internally in non-volatile memory. The memory chip was removed from the unit and the data extracted and converted using in-house software algorithms developed with manufacturer support.

Figure 1. JPI 730/830 as received.



2.1.2. JPI EDM-730/830 Data Description

The data extracted included 66 sessions dated from September 8, 2017¹ through December 6, 2017. Data for the accident flight and several previous flights showed evidence of corruption. This data could not be validated.

2.2. Garmin GDU-620 Device Description

The Garmin GDU-620 is a primary flight display / multi-function display (PFD/MFD) designed to act as the control and display device for the G500 and G600 series integrated flight decks.

¹ All dates and times are referenced to Coordinated Universal Time (UTC).

Figure 2. GDU-620 as received.



2.2.1. Garmin GDU-620 Data Recovery

The GDU-600 does not natively record flight data.

2.2.2. Garmin GDU-620 Data Description

No data was recovered from the GDU-620.