

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



WPR22LA251

ENGINE DATA RECORDING MODULE

Specialist's Factual Report

February 24, 2023

A. ACCIDENT

Location: Salt Lake City, Utah
Date: July 13, 2022
Time: 18:50 mountain daylight time (MDT)
Airplane: Cessna 208B, N877FE

B. ENGINE DATA RECORDING MODULE SPECIALIST

Specialist Sean Payne
Sr. Engineer
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

A data group was not convened. The NTSB Vehicle Recorder Division received the following device:

Recorder Manufacturer/Model: Pratt and Whitney ADAS+
Part Number: EMU-A-010-3
Recorder Serial Number: 1766

1.0 Device Description

The Airframe Data Acquisition System (ADAS) is an engine monitoring system that can record data from a variety of data streams, and several analog sensors. Data is recorded at 2 samples per second, and includes turbine engine instrumentation, airspeed, altitude, date, time, voltages for the main electrical bus and clock battery, and the state of two switches used to control the device.

1.1 Data Recovery

The unit was damaged in the event. The unit's outer housing was displaced. The unit was opened, and the internal contents were displaced but undamaged. The unit was sent to Pratt and Whitney Canada, where it was repaired and downloaded under FAA oversight. The unit produced raw files, which were converted into comma separated values (csv) format data in engineering units using Pratt and Whitney software. Both the raw files and the converted csv files in engineering units were sent to the NTSB. Pratt and Whitney Canada repaired the device and issued paperwork for the unit's return to service (FAA 8130-3). Figure 1 is a photo of the unit in its arrival condition.



Figure 1. Photo of unit showing slight impact damage.

1.2 Recording Description

The data received only included values recorded on the accident day, July 13, 2022. The accident flight was recorded starting 17:22:56.7 MDT and ending 18:50:42.7 MDT on July 13, 2022.

1.3 Parameters Provided

Table 1 describes data parameters provided by the ADSD+. Date, Time, Latitude, Longitude, and GPS Altitude are recorded by the device. Groundspeed and Track are derived from the recorded parameters.

Table 1. ADAS+ Data Parameters.

Parameter Name	Parameter Description
Date	Date for recorded data point (MM/DD/YYYY)
Time	Time (UTC) for recorded data point (HH:MM:SS)
Aircraft Bus Voltage (v)	Main Bus Voltage (volts)
Engine Wf (pph)	Fuel Flow (pounds per hour)
Engine Torque (ftlbs)	Engine Torque (foot pound force, ft lbf)
Engine ITT (deg. C)	Internal Turbine Temperature (degrees Celsius)
Engine Np (rpm)	Propellor RPM (RPM)
Engine Ng (%)	Gas Generator Speed (percent)
Engine (shp)	Engine (shaft horsepower)
Altitude (ft)	Pressure Altitude (feet)
Airspeed (kts)	Indicated Airspeed (knots)

D. OVERLAYS AND TABULAR DATA

Data obtained from the data module was used to produce the following plots.

Figure 2 is a plot for the time interval between 17:20 MDT and 18:55 MDT. This plot encompasses extracted data from the unit for the entire accident flight.

Figure 3 is a plot for the time interval between 18:42 MDT and 18:51 MDT. This plot encompasses extracted data from the unit for the descent and landing portion of the accident flight.

Figure 4 is a plot for the time interval between 18:49 MDT and 18:50 MDT. This plot encompasses extracted data from the unit for the landing portion of the accident flight. The data describes the aircraft on an approach to landing. Around 18:50:24, as the aircraft was descending through 4,170 feet at an airspeed of approximately 75 knots, values for engine power began climbing rapidly. The torque quickly increased to 1,250 ft lbf and stabilized; other engine parameters increased correspondingly. Airspeed and altitude data shows a slight increase and sudden decrease by the end of the recording at 18:50:42.7 MDT.

The corresponding tabular data used to create the following three figures are provided in electronic comma separated value (CSV) format as attachment 1 to this report.

Submitted by:

Sean Payne
Sr. Engineer

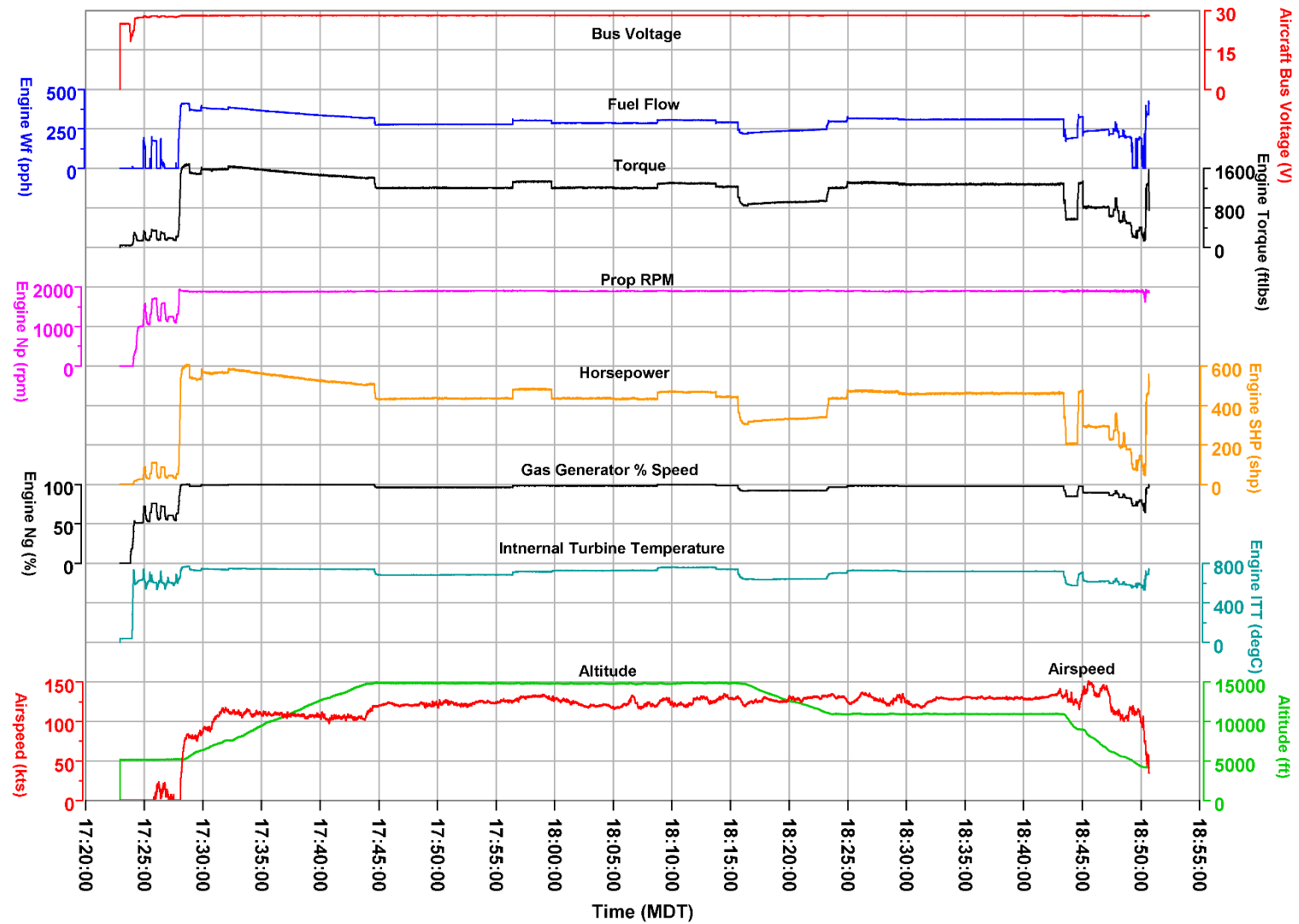


Figure 2. Plot of data parameters for the entire flight.

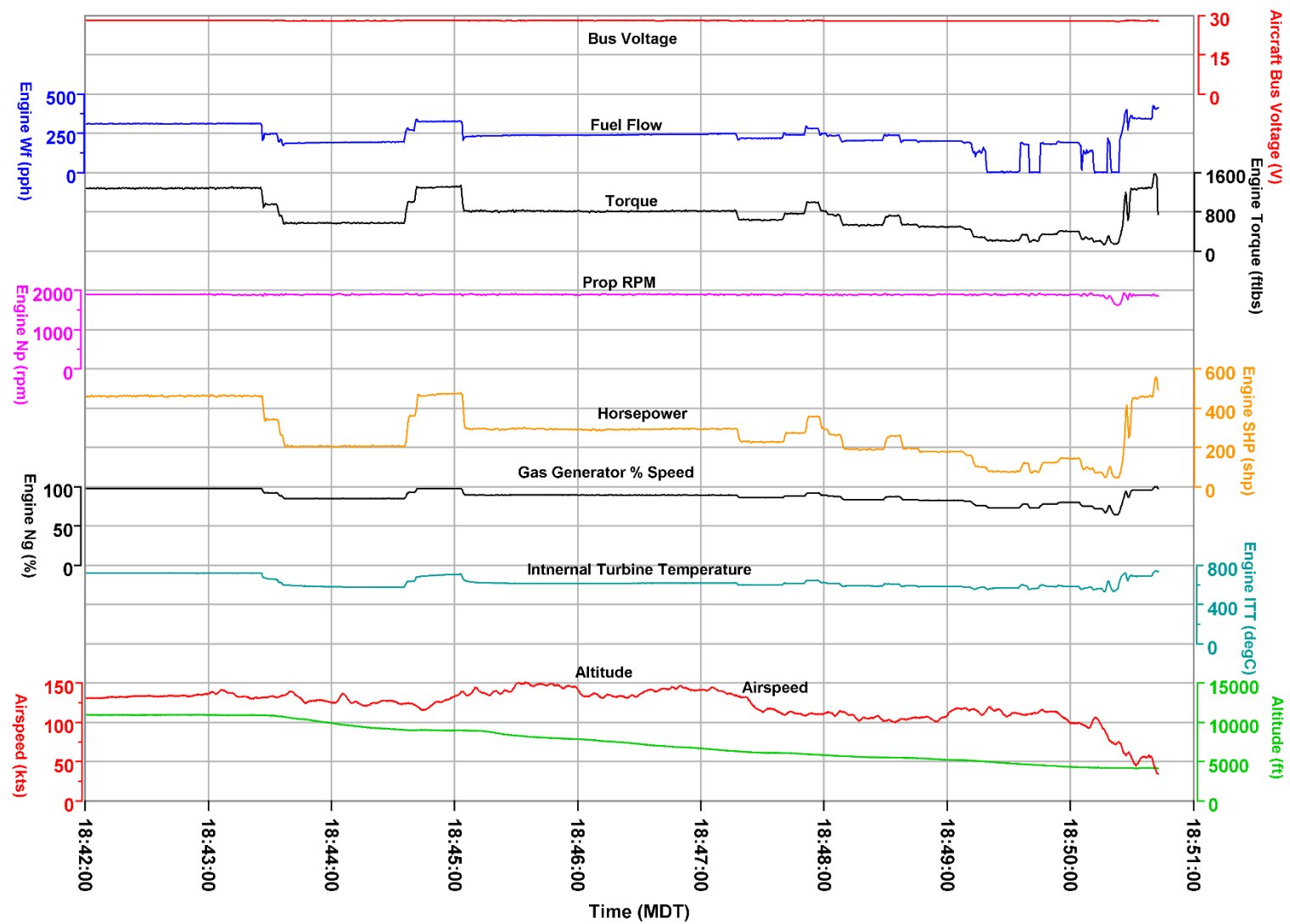


Figure 3. Plot of data parameters for the descent portion of flight.

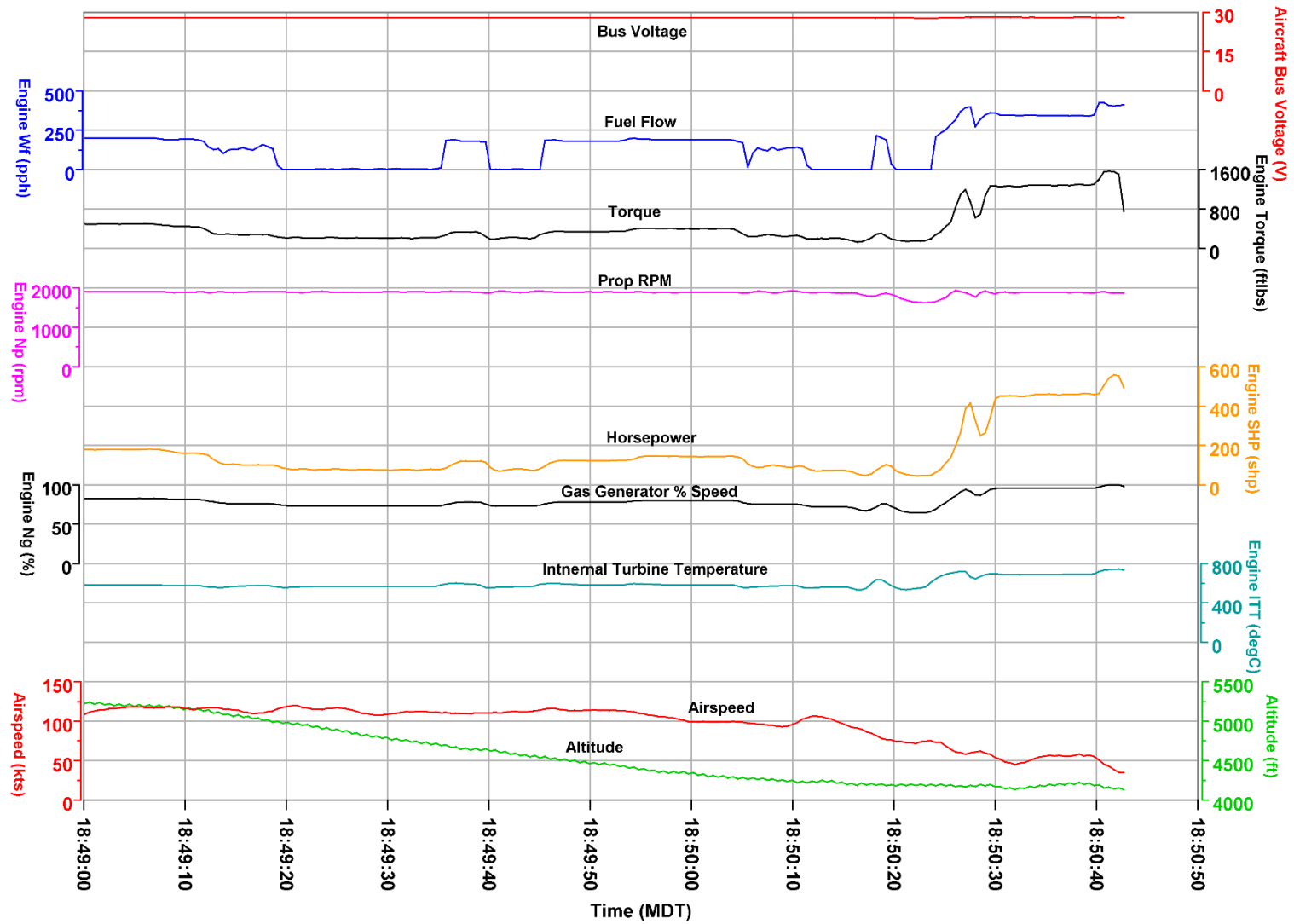


Figure 4. Plot of data parameters for the landing portion of the flight.