

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, DC 20594

June 25, 2014

Cockpit Display

Specialist's Factual Report By Christopher Babcock

1. EVENT SUMMARY

Location: Durango, Colorado
Date: June 1, 2014
Aircraft: Cirrus SR22
Registration: N583KM
Operator: Private
NTSB Number: CEN14LA277

On June 1, 2014, a privately operated Cirrus Design SR22, registration N583KM, was substantially damaged following a loss of engine power at the Animas Air Park, Durango, CO. The student pilot, and sole occupant, of the aircraft was not injured. Visual meteorological conditions prevailed, and no flight plan was filed for the flight that originated at Santa Monica Municipal Airport, Santa Monica, CA. The flight was operated under the provisions of *Title 14 Code of Federal Regulations* Part 91. The Multifunction Display (MFD) compact flash (CF) card was recovered from the accident airplane and forwarded to the National Transportation Safety Board's Vehicle Recorder Laboratory for evaluation.

2. GROUP

A group was not convened.

3. FDR CARRIAGE REQUIREMENTS

The accident aircraft, N583KM, was manufactured in 2002, and was not required to carry any flight recording device.

4. DETAILS OF FLIGHT DATA RECORDER INVESTIGATION

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

Device Manufacturer/Model: **Avidyne Entegra EX5000 MFD CF Card**
Device Serial Number: **NA**

4.1. Multifunction Display (MFD)

4.1.1. Recorder Description

The Avidyne Entegra EX5000 MFD unit contains a Compact Flash (CF) memory card located in a slot on the side of the unit. This memory card contains all of the software that the MFD needs to operate. The MFD also has a data logging function that stores periodic information such as engine parameters and flight track data. Specifically, the

MFD records GPS position, engine performance data (such as RPM, engine temperatures, outside air temperature, fuel flow), and some electrical bus conditions.

The MFD generates a new data file for each power-on cycle. The oldest file is dropped and replaced by a new recording once the storage limit has been reached. MFD data are sampled every six seconds. The sampled data is accumulated in a temporary memory buffer that is written out to the memory card once every minute. If an abrupt power interruption occurs, the data that is being accumulated in the temporary buffer is lost. Depending on when the power interruption occurs in relation to the one-minute write cycle determines how much of the last minute of data is lost.

4.1.2. Recorder Damage

The MFD was not damaged and was downloaded normally (Figures 1 & 2).

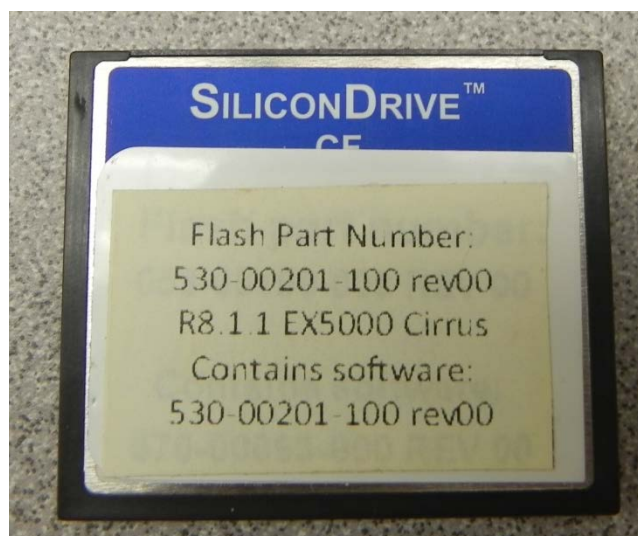


Figure 1. Obverse side of CF card.



Figure 2. Reverse side of CF card.

4.2. Engineering Units Conversions

Data files downloaded from the card are in plain text format and no conversions were necessary. Where applicable, the sign conventions have been changed to ensure that the parameters conform to the NTSB's standard sign convention that climbing right turns are positive (CRT=+).¹

Appendix A lists the MFD parameters verified and provided in this report.

4.3. Time Correlation

Data is recorded in Universal Coordinated Time (UTC) once every 6 seconds. A 6 hour offset was applied to the times to convert to the local MDT time of the accident.

¹ CRT=+ means that for any parameter recorded that indicates a climb or a right turn, the sign for that value is positive. Also, for any parameter recorded that indicates an action or deflection, if it induces a climb or right turn, the value is positive. Examples: Right Roll = +, Pitch Up = +, Elevator Trailing Edge Up = +, Right Rudder = +.

4.4. Plots and Corresponding Tabular Data

Figure 3 shows MFD data recorded over the entire accident flight. Figure 4 shows MFD data recorded over the final 12 minutes of the accident flight. Figure 5 shows the flight track from the end of the accident flight overlaid onto satellite imagery of the local area.

Christopher Babcock
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Vehicle Recorder Division

Cirrus SR22, N583KM

Location, Date: Durango, Colorado, 06/01/14

NTSB No. CEN14LA277

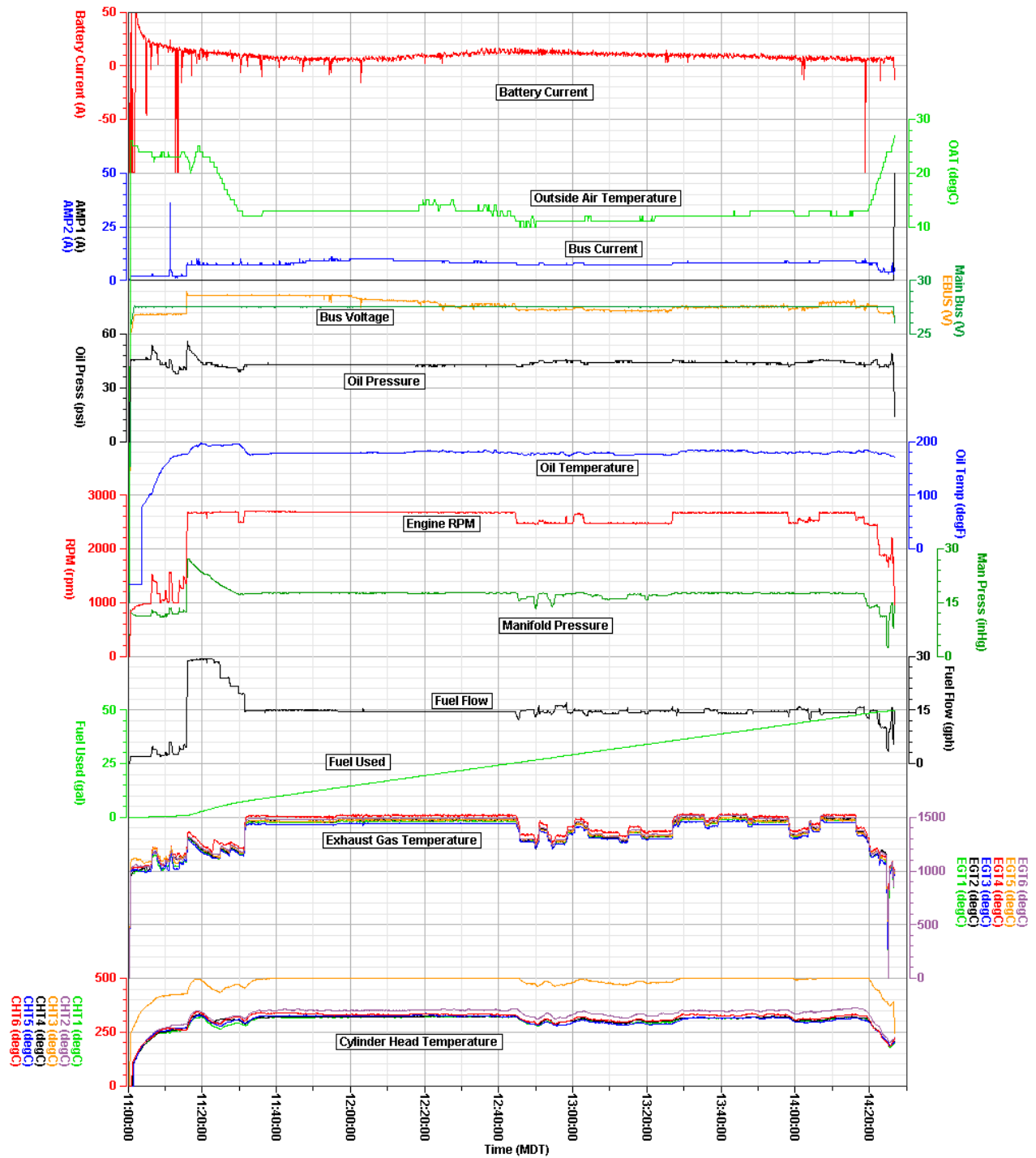


Figure 3. MFD data from entire accident flight.

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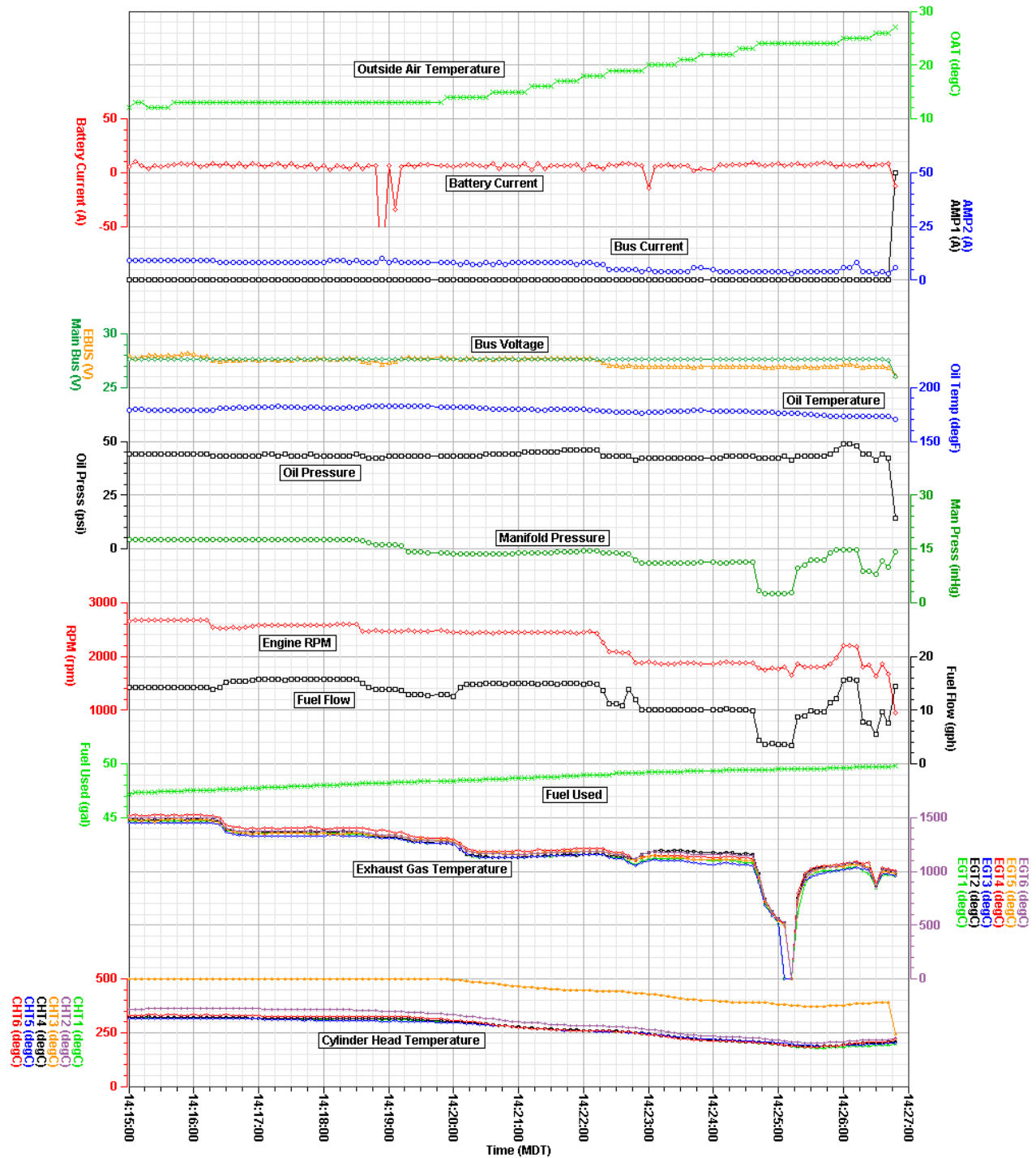


Figure 4. MFD data from last 12 minutes of accident flight.

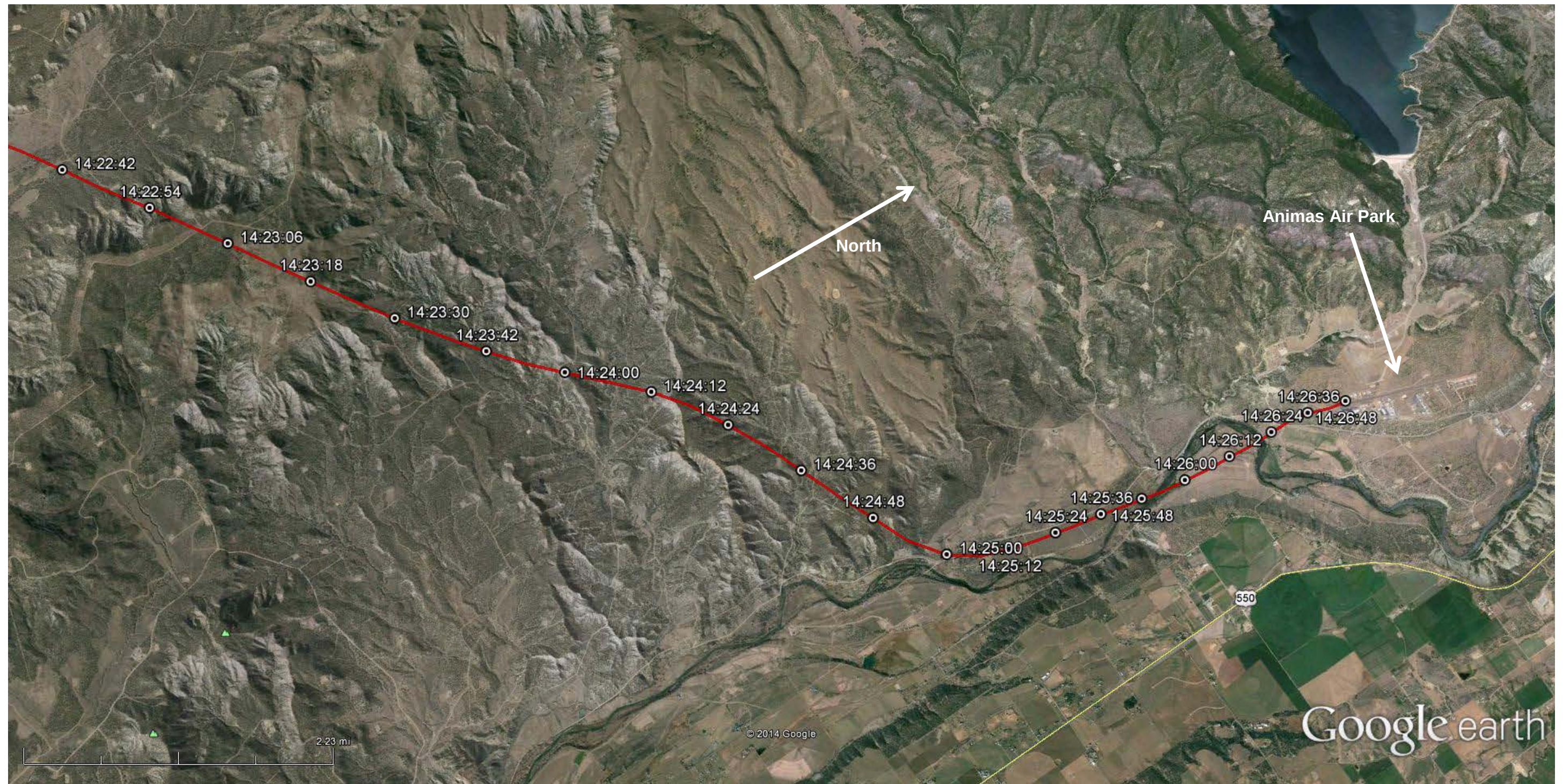


Figure 5. Track overlay on satellite imagery.

APPENDIX A

Table A-1 lists the verified parameters and table A-2 describes the unit abbreviations used in this report.

Table A-1. Verified and provided MFD parameters.

Parameter Name	Parameter Description
CHT Cyl 1 (degF)	#1 Cylinder Head Temperature
CHT Cyl 2 (degF)	#2 Cylinder Head Temperature
CHT Cyl 3 (degF)	#3 Cylinder Head Temperature
CHT Cyl 4 (degF)	#4 Cylinder Head Temperature
CHT Cyl 5 (degF)	#5 Cylinder Head Temperature
CHT Cyl 6 (degF)	#6 Cylinder Head Temperature
EGT Cyl 1 (degF)	#1 Cylinder Exhaust Gas Temperature
EGT Cyl 2 (degF)	#2 Cylinder Exhaust Gas Temperature
EGT Cyl 3 (degF)	#3 Cylinder Exhaust Gas Temperature
EGT Cyl 4 (degF)	#4 Cylinder Exhaust Gas Temperature
EGT Cyl 5 (degF)	#5 Cylinder Exhaust Gas Temperature
EGT Cyl 6 (degF)	#6 Cylinder Exhaust Gas Temperature
Man Press (inHg)	Engine Manifold Pressure
Oil Press (psi)	Engine Oil Pressure
Oil Temp (degF)	Engine Oil Temperature
RPM (rpm)	Engine RPM
Latitude (deg) ^a	Latitude
Longitude (deg) ^a	Longitude
OAT (degC)	Outside Air Temperature
Battery Current (A)	Battery Current
AMP1 (A)	Bus 1 Current
AMP2 (A)	Bus 2 Current
Main Bus (V)	Main Bus Voltage
EBUS (V)	Essential Bus Voltage
Fuel Flow (gph)	Totalizer Fuel Flow
Fuel Used (gal)	Calculated Fuel Used

^a Information is contained in tabular data only

Table A-2. Unit abbreviations.

Units Abbreviation	Description
deg	degrees
degF	degrees Fahrenheit
degC	degrees Celsius
gph	gallons per hour
Gal	gallons
inHg	Inches Mercury
rpm	revolutions per minute
V	volts
A	amps
Psi	pounds per square inch