

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

May 11, 2022

Recorded Flight Data

Specialist's Factual Report by Gerald Kawamoto

1. EVENT

Location: Juneau, Alaska
Date: October 22, 2021
Aircraft: Cessna 208B
Registration: N754KP
Operator: Private
NTSB Number: ANC22LA003

2. RECORDED FLIGHT DATA GROUP

A recorded flight data group was not convened.

3. DETAILS OF INVESTIGATION

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

Recorder Manufacturer/Model: **64MB SmartMedia Card from Chelton IDU**
Recorder Serial Number: **N/A**

Recorder Manufacturer/Model: **16MB SmartMedia Card from Chelton IDU**
Recorder Serial Number: **N/A**

3.1.1. Device Description

The IDU devices are configured to operate as primary flight displays (PFD) or multi-function displays (MFD). Using external sensors, including solid-state Air Data and Attitude Heading Reference System (ADAHRS), the PFD displays aircraft parameter data including altitude, airspeed, attitude, vertical speed, and heading. The MFD displays navigational information by way of a moving map. Additionally, the units may contain a terrain awareness and warning system (TAWS) that may provide aural and color-coded warnings of terrain depending on pilot selections.

Figure 1 shows a screen capture from the Chelton Installation Manual of data parameters potentially recorded by each IDU once per second; the actual parameters recorded varies

depending upon the installation.¹ The recording logic retains up to five hours of data from each of the last five flights.

First Line (Flight)	Second Line (Engine #1)	Third Line (Engine #2)
Latitude (°)	RPM	RPM
Longitude (°)	Fuel Flow (GPH)	Fuel Flow (GPH)
MSL Altitude (ft)	Aux. 1	Aux. 1
Pitch Angle (°)	Left Fuel (Gal.)	--
Bank Angle (°)	Right Fuel (Gal.)	--
Heading (° Mag.)	Fuel Pressure (PSI)	Fuel Pressure (PSI)
Track (° Mag.)	Aux. 5	Aux. 5
IAS (kts)	Oil Temperature (°F)	Oil Temperature (°F)
TAS (kts)	Oil Pressure (PSI)	Oil Pressure (PSI)
Ground Speed (kts)	Volts	Volts
VSI (fpm)	EGT #1 (°F)	EGT #1 (°F)
Glidepath (°)	CHT #1 (°F)	CHT #1 (°F)
G-force	EGT #2 (°F)	EGT #2 (°F)
Wind Speed (kts)	CHT #2 (°F)	CHT #2 (°F)
Wind Direction (° Mag.)	EGT #3 (°F)	EGT #3 (°F)
OAT (°F)	CHT #3 (°F)	CHT #3 (°F)
Density Altitude (ft)	EGT #4 (°F)	EGT #4 (°F)
Fuel Totalizer Qty. (Gal.)	CHT #4 (°F)	CHT #4 (°F)
--	EGT #5 (°F)	EGT #5 (°F)
--	CHT #5 (°F)	CHT #5 (°F)
--	EGT #6 (°F)	EGT #6 (°F)
--	CHT #6 (°F)	CHT #6 (°F)
--	Aux. Temp. 1 (°F)	Aux. Temp. #1 (°F)
--	Aux. Temp. 2 (°F)	Aux. Temp. #2 (°F)
--	Induction Temperature (°F)	Induction Temperature (°F)

Figure 1. Potential parameters recorded by each IDU.

3.2. Data Recovery

Data from the IDUs were exported to SmartMedia cards by the on-scene investigation team and the IDUs were not sent to the NTSB Vehicle Recorder Laboratory. The SmartMedia cards, as shown in Figure 2, were downloaded normally using laboratory tools.



¹ Chelton Flight Systems EFIS-SV Installation Guide, 64-000038 Revision C

Figure 2. SmartMedia cards as received.

3.3. Data Description

Each SmartMedia card contained five LOG files recorded from October 21, 2021, Universal Coordinated Time (UTC), through October 22, 2021. Data from each card was compared and found to be redundant, thus, only data from the 64MB card are included in this report.

The last file, LOG00, started at 16:39:32 UTC and ended at 16:43:21 UTC, and is included in this report. Data were sampled once per second.

3.4. Parameters Provided

The IDU records information in engineering units, therefore, no conversions were necessary. Where applicable, changes may have been made to ensure the parameters conform to the NTSB's standard sign convention that climbing right turns are positive (CRT=+).² Table 1 describes parameters recorded and validated.

Table 1. Parameters Provided.

Parameter Name	Parameter Description
Date	MM-DD-YYYY
Time (HH:MM:SS)	UTC Time (hours:minutes:seconds)
Altitude (ft)	MSL Altitude (feet)
Bank (deg)	Roll Angle (degrees)
G-Force (g)	Vertical Acceleration (gs)
Ground Speed (kts)	Ground Speed (knots)
Heading (deg Mag)	Magnetic Heading (degrees)
IAS (kts)	Indicated Airspeed (knots)
Latitude (deg)	Latitude (degrees)
Longitude (deg)	Longitude (degrees)
Pitch (deg)	Pitch Angle (degrees)
TAS (kts)	True Airspeed (knots)
Track (deg Mag)	Magnetic Track (degrees)
VSI (fpm)	Vertical Speed (feet per minute)
Wind Speed (kts)	Wind Speed (knots)

² 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, that value is positive. Examples: Right Roll = +, Left Aileron Trailing Edge Down = -, Right Aileron Trailing Edge Up = +, Pitch Up = +, Elevator Trailing Edge Up = +.

3.5. Plots and Corresponding Tabular Data

The following three figures contain data from the last recorded data log on October 22, 2021.

Figure 3 is a graphical overlay generated using Google Earth for LOG00. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

Figure 4 is a plot of parameters for LOG00. The time interval displayed is 16:39:30 to 16:43:30 UTC.

Figure 5 is a plot of parameters for LOG00 between 16:41:30 and 16:42:20 UTC.

The corresponding tabular data used to create Figures 3 through 5 are provided in electronic (*.csv³) format as Attachment 1 to this report.

³ Comma Separated Value format.

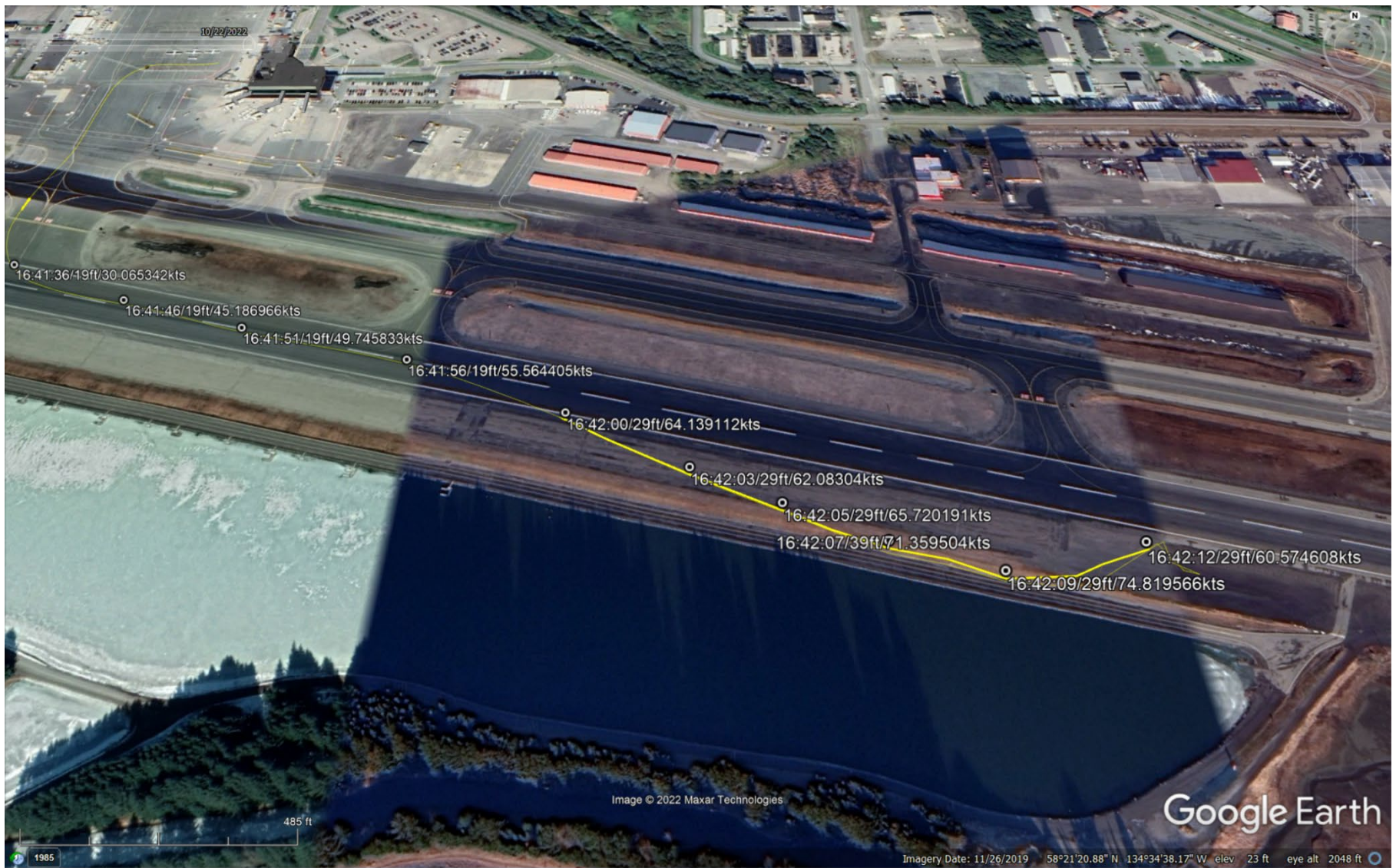


Figure 3. Google Earth overlay of LOG00. Ground Speed values are shown.

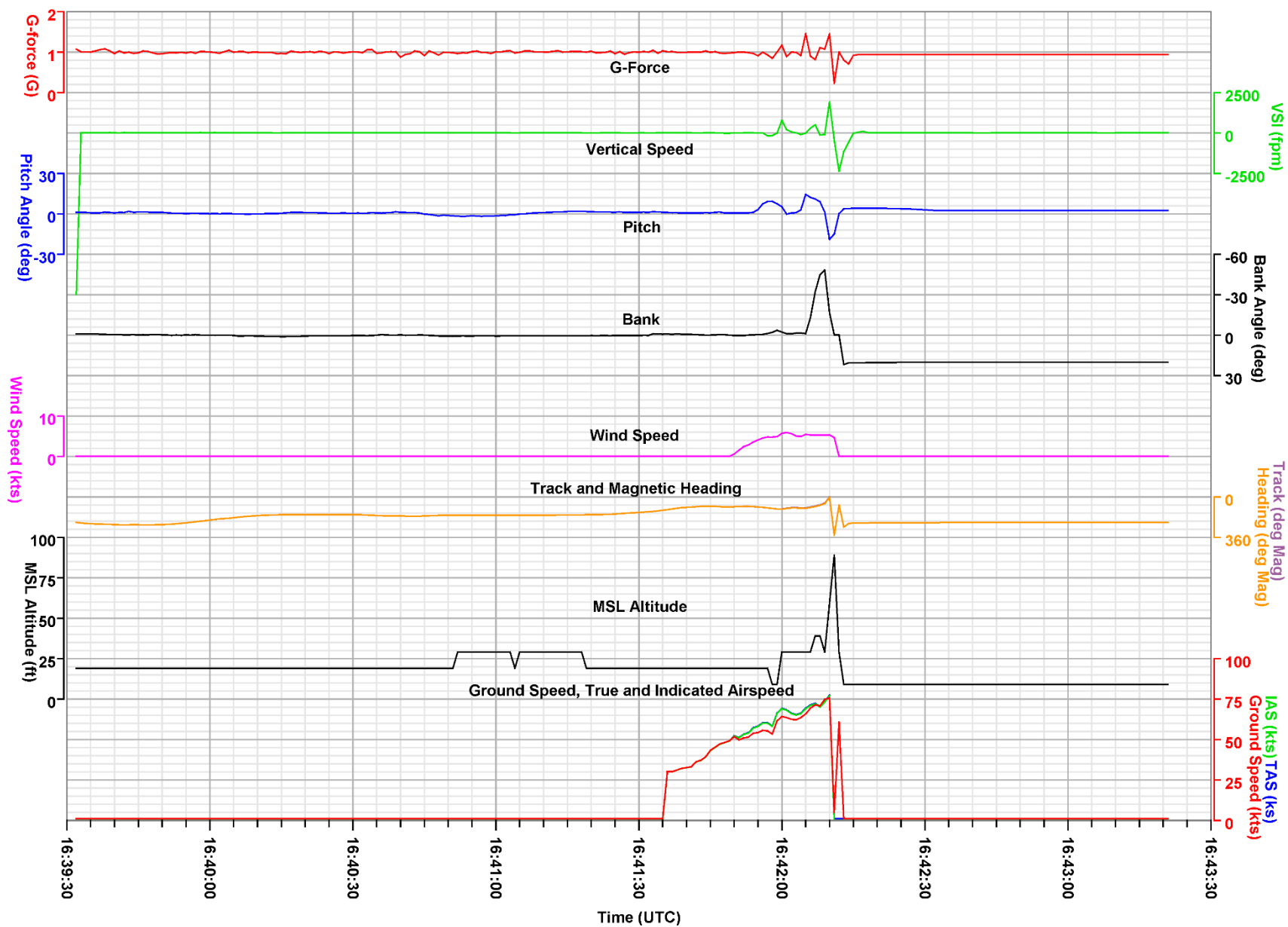


Figure 4. Plot of parameters for LOG00.

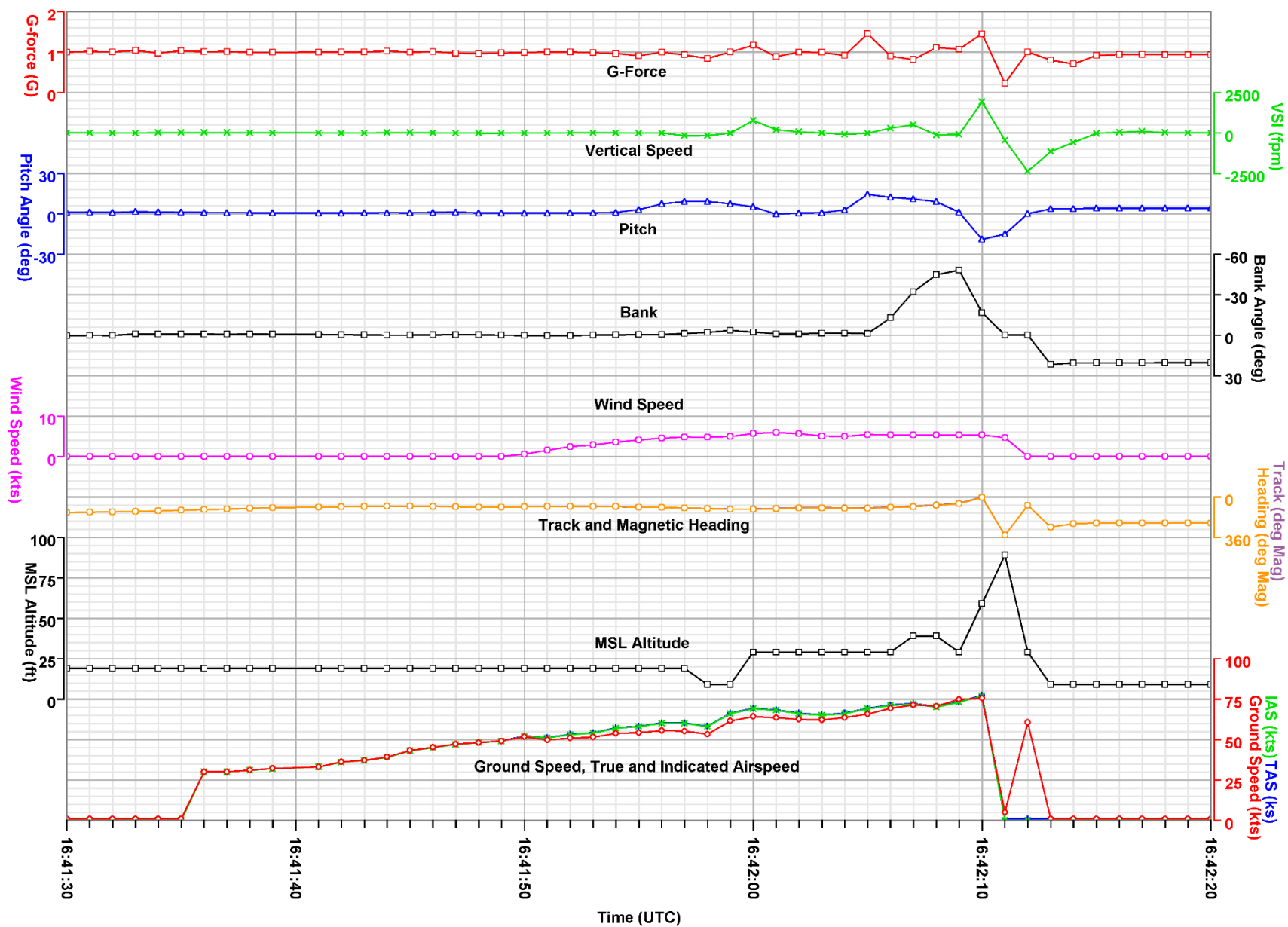


Figure 5. Plot of parameters between 16:41:30 and 16:42:20 UTC for LOG00.