

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

March 17, 2020

Global Positioning System Device

Specialist's Factual Report

By W. Deven Chen

1. EVENT SUMMARY

Location: Bronson, Michigan
Date: August 18, 2018
Aircraft: Air Tractor 502B
Registration: N502RL
Operator: Lutes Flying Service
NTSB Number: CEN18FA339

On August 18, 2018, about 1730 eastern daylight time, an Air Tractor 502B, N502RL, was destroyed when it impacted terrain while maneuvering during an aerial application flight near Bronson, Michigan. The pilot was fatally injured. The aircraft was registered to and operated by Lutes Flying Service, Inc. under the provisions of 14 *Code of Federal Regulations* Part 137 as an aerial application flight. The local flight originated from the Wolfe Field Airport (IN65), near Shipshewana, Indiana, at an unconfirmed time.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following global positioning system (GPS) device:

Device Manufacturer/Model:	AgNav Guia Platinum P771
Serial Number:	771150107

3.1. Device Description

The AgNav Guia Platinum P771 is a compact GPS device used to provide pilots customizable agricultural spray application data on a color moving map. The unit has an 8.4-inch touch screen display and is enclosed in a ruggedized housing. The moving map displays a customizable interface which allows pilots to monitor application information and navigational landmarks. The device includes a built-in wireless internet adapter, as well as a 3G SIM card slot for mobile internet. The device has an obstacle warning feature

which is compatible with FAA tower obstacle data and provides pilots warnings regarding incoming obstacles and power lines.

3.2. Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the device sustained minor damage on the touch screen, as shown in Figure 1. The device did not power on normally.



Figure 1: Front and Back of AgNav GUIA PLATINUM as received.

After further examination, several internal wire connections were found disconnected, and the USB port was broken internally as well. After repairing the damaged parts, the device powered on normally and data was downloaded via USB, as shown in Figure 2.

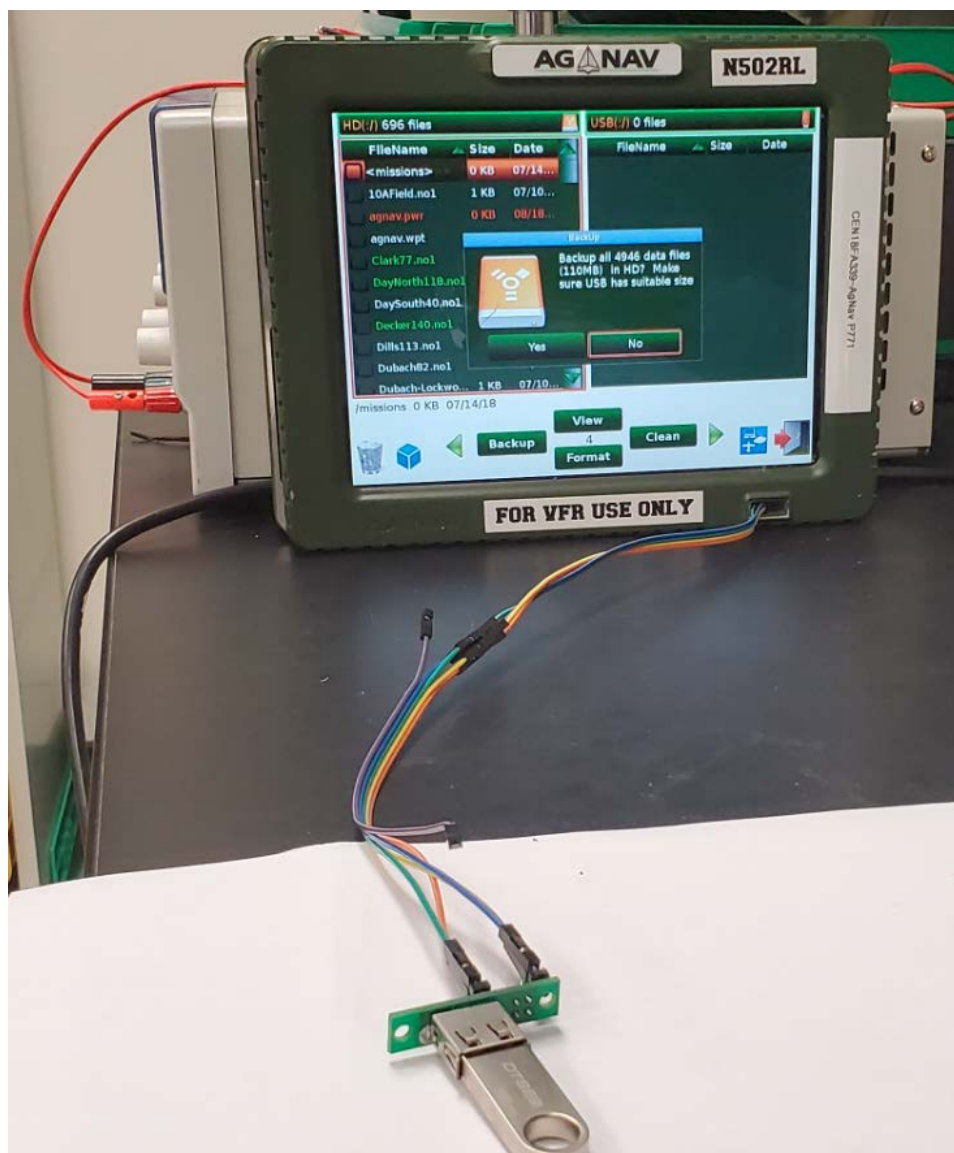


Figure 2: Transfer of Stored Data.

3.3. Data Description

The data download included 4,946 data files. The files contained data related to flight sessions from June 24, 2016, to August 18, 2018. The data was decoded with technical assistance from the manufacturer. The last recorded flight session was determined to be related to the accident. Data for the accident flight began at 17:22:53.60 and ended at

17:27:11.00 in August 18, 2018. Times are provided in Eastern Daylight Time (EDT) which were converted from the GPS times from the decoded data.

3.4. Parameters Provided

Table 1 describes data parameters provided by the GPS device. GPS Time, Latitude, Longitude, GPS Altitude, Dilution of Precision, Heading, and Spray Condition are recorded by the device. Groundspeed and Track are derived from the recorded parameters.

Table 1: GPS Data Parameters.

Parameter Name	Parameter Description
TIMEGPS	GPS Time for recorded data point
TIME	Converted Time (EDT) for recorded data point
LAT	Recorded Latitude (degrees)
LON	Recorded Longitude (degrees)
ALTft	Recorded GPS Altitude (feet)
DOP	Dilution of Precision
TSLU	Time Since Last Update
SAT	Satellites Used
SPmph	Average groundspeed (miles per hour)
SPkts	Derived average groundspeed (knots)
HEAD	Average derived ground track/Heading (degrees, true)
SPRY	Spray Condition (0=OFF, 1=ON)
GalPMR	Required Spray Speed (gallons per minute)
GalPMA	Applied Spray Speed (gallons per minute)

3.5. OVERLAYS AND TABULAR DATA

Figure 3 is a graphical overlay generated using Google Earth for the accident flight. The data plot was generated from the manufacturer's software. The blue outline shows the aerial application boundary that the user set in the AgNav device. The light green and pink areas show regions of aerial application. The yellow lines show the flight path. Altitude is not depicted. 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 graphical overlay generated using Google Earth for the accident flight generated using NTSB software tools. The aircraft's altitude is depicted.

Figure 5 is a graphical overlay generated using Google Earth for the accident flight generated using NTSB software tools. The data of the last recorded point is depicted.

Figure 6 is a plot of parameters from the AgNav device for the accident flight. The time interval is 17:22:30 to 17:27:30 EDT on August 18, 2018.

Tabular data used to generate figures 3 through 6 are included as Attachment 1. This attachment is provided in electronic comma-delimited (.CSV) format.

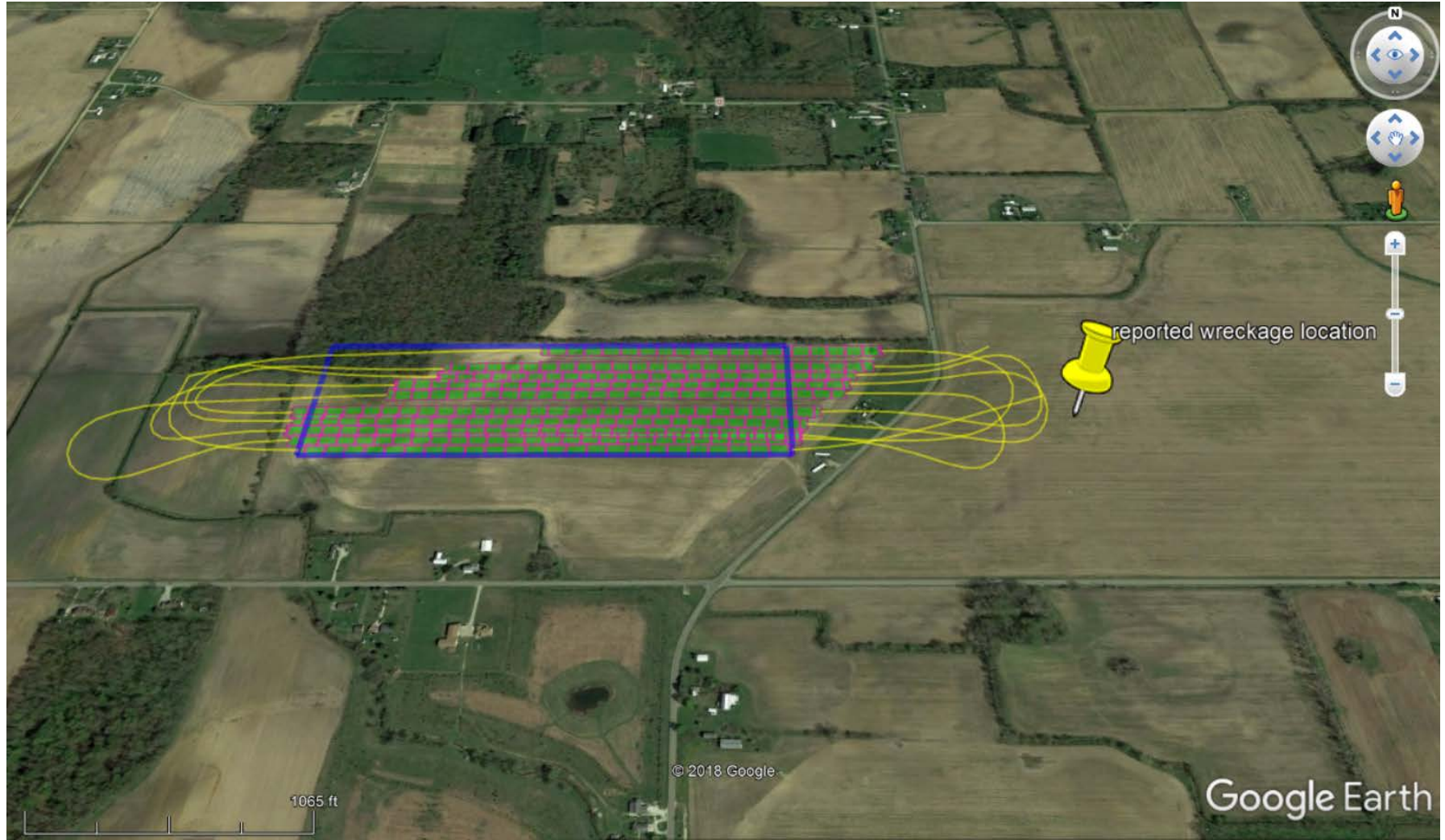


Figure 3: Google Earth overlay showing the entire flight with spray area and spray coverage.



Figure 4: Google Earth overlay showing the entire flight with altitude.

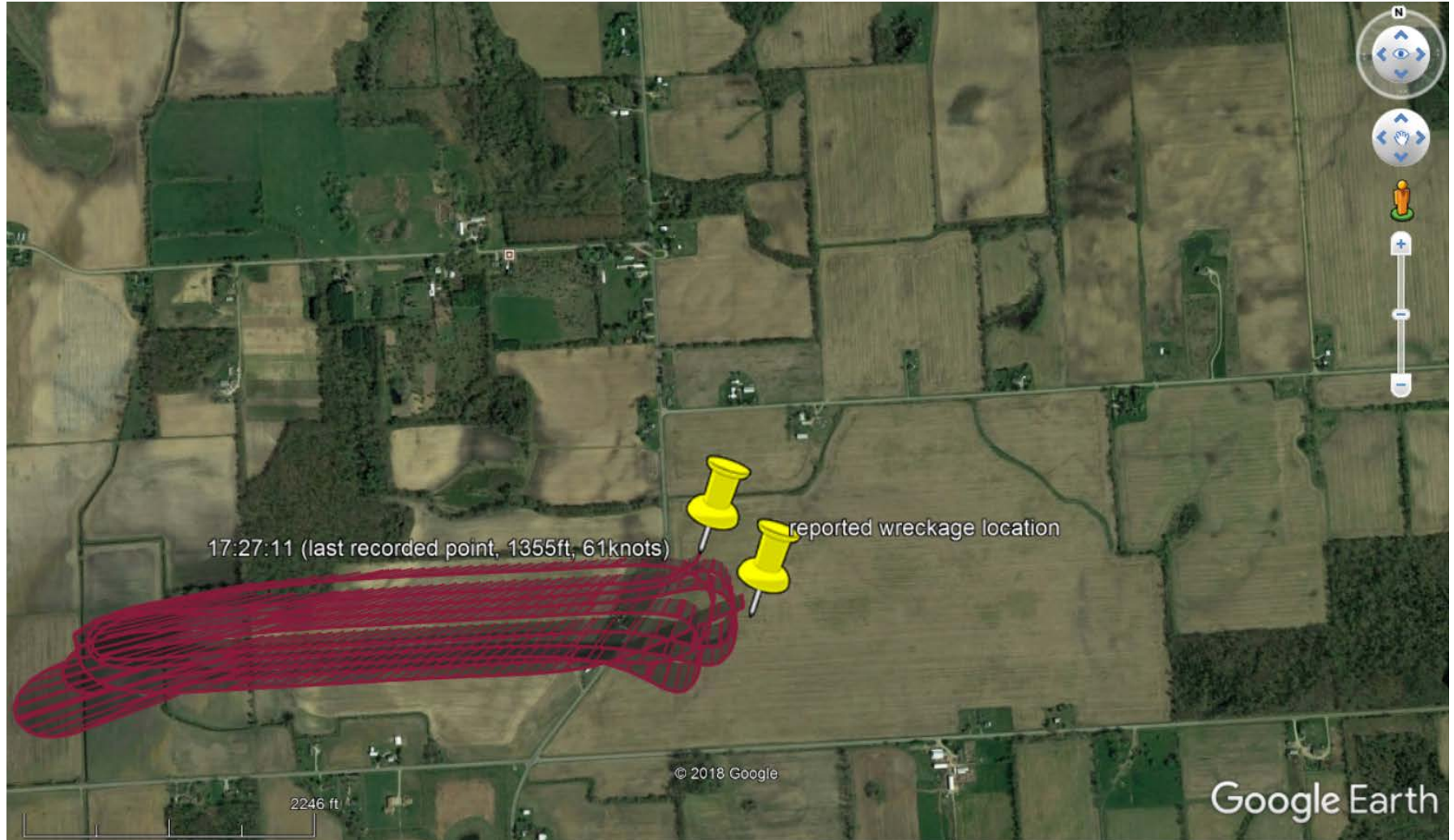
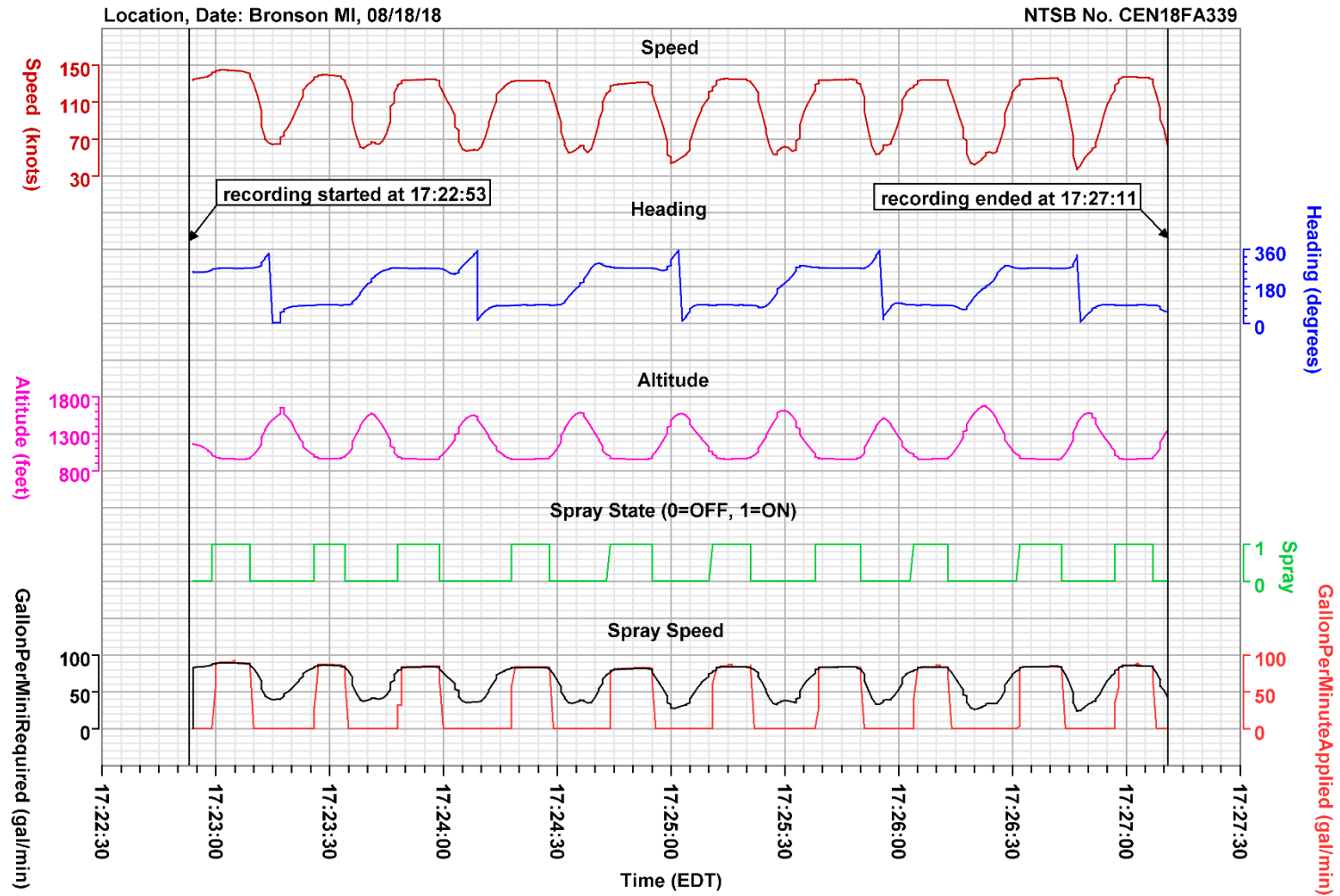


Figure 5: Google Earth overlay showing the last recorded point with time, altitude and derived speed.

Lutes Flying Service, Air Tractor AT-502, N502RL



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Figure 6: Data Plot of the accident flight.