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

August 19, 2013

Electronic Device Factual Report

Specialist's Factual Report
by Bill Tuccio

A. EVENT

Location:	Jennings, Lousiana
Date:	February 15, 2013
Aircraft:	WSK PZL Mielec M-18A
Registration:	N4305D
Operator:	Riceland Aviation, Inc.
NTSB Number:	CEN13LA163

B. GROUP - No Group

C. SUMMARY

On February 15, 2013, about 1710 central standard time (CST), N4305D, a WSK PZL Mielec M-18A, single engine airplane, was destroyed after impacting terrain near Jennings, Louisiana. The pilot was fatally injured. The airplane was registered to and operated by Riceland Aviation, Inc. Day visual meteorological conditions (VMC) prevailed at the time of the accident and a flight plan had not been filed for the 14 *Code of Federal Regulations* Part 137 agricultural application flight. The local area flight had departed at 1650 from Jennings Airport (3R7), Jennings, Louisiana.

D. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Laboratory received the following device(s):

GPS Manufacturer/Model:	Hemisphere AgJunction Satloc G4
Serial Number:	806-1040-W

Hemisphere AgJunction Satloc G4 Device Description

The Satloc G4 is part of an on-board control system designed to programmatically control agricultural, aerial spray operations based on vendor and user specified prescription maps. The Satloc G4 can drive a cockpit mounted lightbar guidance system and a real-time graphic moving map display providing visual guidance to the pilot. Flow rates can be pilot selected or based on mapping created using a

proprietary software package called MapStar that runs on a desktop computer. The Satloc G4 is capable of realtime wireless transmission of position and agricultural information to a cloud based data collection service in addition to recording similar information to an internal, eSata solid state disk drive. The Satloc G4 is supported by the Satloc division of AgJunction, previously named Hemisphere GPS.

Satloc G4 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the device had not sustained any damage, as shown in figure 1. The unit was opened and the internal eSata drive removed, as shown in figure 2. The eSata drive was formatted as a Microsoft Windows file system, and binary log files were copied from the eSata drive. The log file on February 15, 2013 containing the accident flight was decoded using AgJunction's MapStar software.

Figure 1. Photo of Satloc G4.

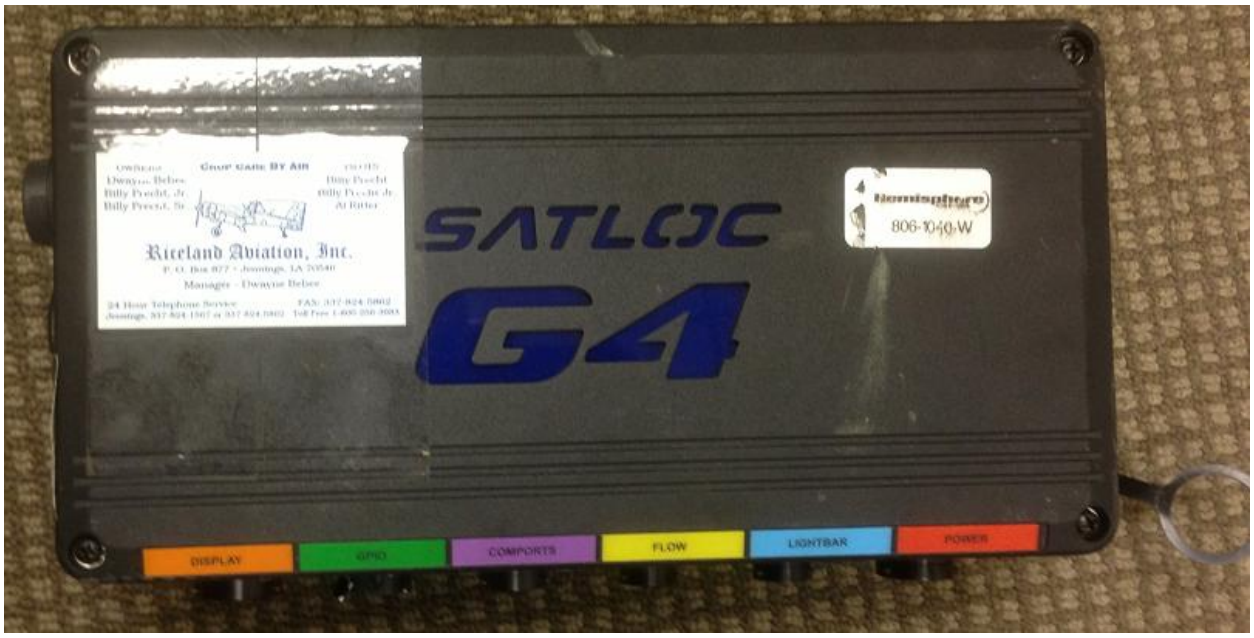
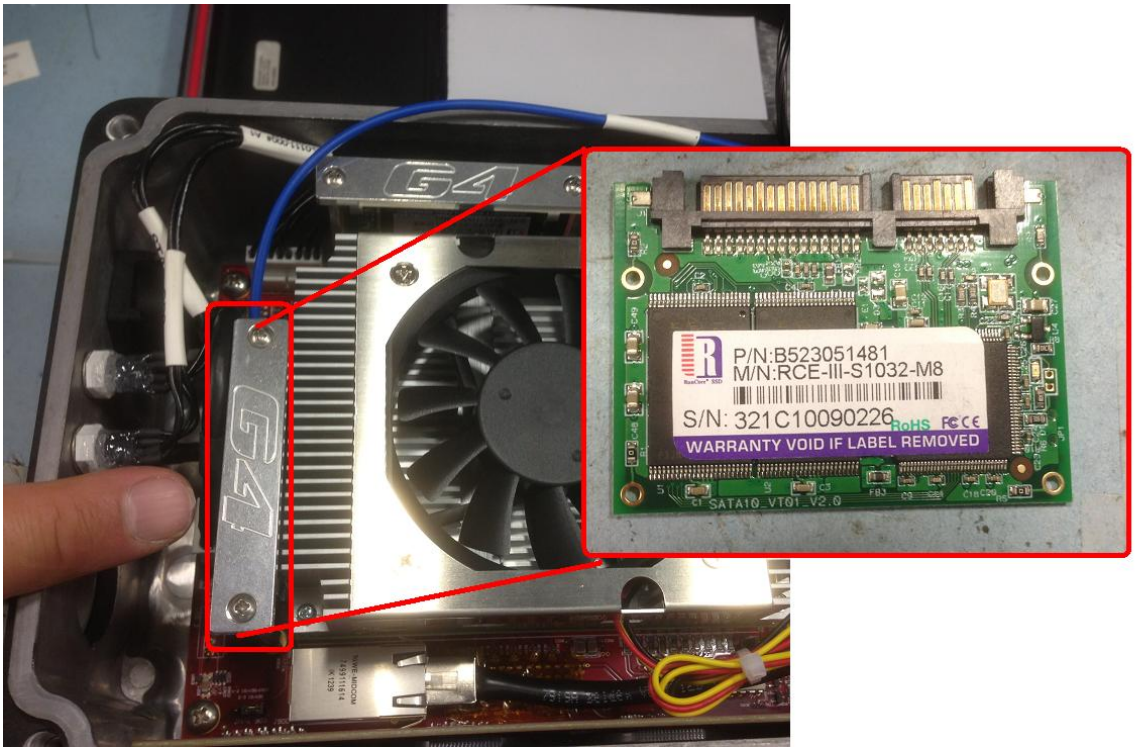


Figure 2. eSata solid state drive removed from Satloc G4.



Satloc G4 Description

The log files downloaded from the Satloc G4 dated back to at least January 8, 2013 and extended through February 15, 2013. Three recording sessions occurred on February 15, 2013, the last of which recorded the accident flight. Only the last recording on February 15, 2013 was analyzed for this report. The MapStar program provided an overview of the recorded flight path and spraying operations and also allowed for export of the recorded data in engineering units. The sampling rate of the recording was approximately once every 2 seconds.

The MapStar export provided a time for each sampling interval precise to the hundredth of a second. However, the accuracy and timezone of the MapStar export was not verified for this report. As such, all times are reported as “Satloc recorded time.”

The time period of the last recording was from 1551:20.39 to 1756:38.29 Satloc recorded time. According to the manufacturer, if power is interrupted to the unit, up to 6 seconds of data may not be recorded due to latency in the recording mechanism.

Satloc G4 Parameters Provided

Table 1 describes data parameters provided by the Satloc G4 device validated for this report.

Table 1: Satloc G4 Data Parameters

Parameter Name	Parameter Description
Time	MapStar reported time for recorded data point (HH:MM:SS.tt)
Lat	Recorded Latitude (degrees)
Lon	Recorded Longitude (degrees)
Alt	Recorded Altitude (feet)
Speed	Recorded groundspeed (mph)
Hdg	Recorded true course (degrees)
X-Track	Distance to desired target spray swath line (feet)
Spray	Discrete value indicating spray on or off (0=off, non-zero=on)

OVERLAYS AND TABULAR DATA

Figure 3 shows a MapStar output from the file containing the accident flight. The output covers the period from 1551:20.39 to 1756:38.29 Satloc recorded time on February 15, 2013. The red areas in Figure 3 are those areas where the Spray discrete recorded value was non-zero. Figure 4 shows the same time period as figure 3, overlayed using Google Earth, with select points annotated. The last recorded point at 1756:38.29 Satloc recorded time is shown in the eastern portion of the recorded track.

Figure 5 shows the many passes in the vicinity of the radio tower the aircraft eventually struck, as reported by the investigator-in-charge. Only one recorded pass crossed the field nearest the tower on a west-to-east track prior to the end of the recording.

Figure 6 shows expanded detail of the end of the flight. The west-to-east pass prior to the accident pass is shown commencing at about 1754:34 Satloc recorded time, followed by a course reversal at 1755:23 Satloc recorded time. The recorded data ended at 1756:38, on a west-to-east track towards the tower, ending prior to the tower.

Figure 7 shows a plot of recorded parameters around the end of the recording. The aircraft had just descended to about 200 feet prior to the end of the recording and was at a speed of about 120 mph.

Tabular data used to generate figures 3 through 7 are included as Attachment 1. This attachment is provided in electronic comma-delimited (.CSV) format.

Figure 3. MapStar output of track and spray pattern.

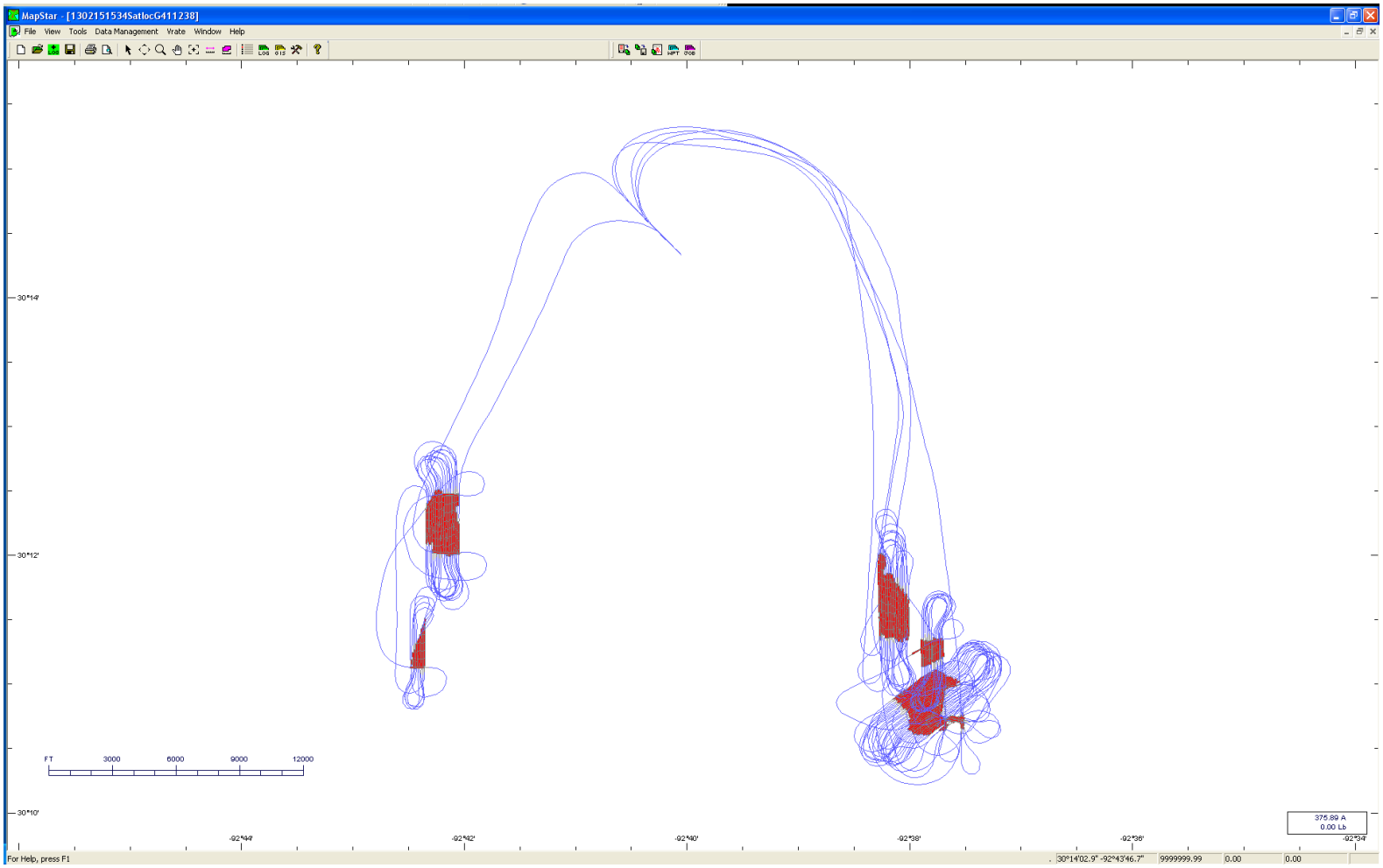


Figure 4. Google Earth overlay of ground track for entire recording.

Figure 5. Google Earth overlay of ground track near radio tower of collision.

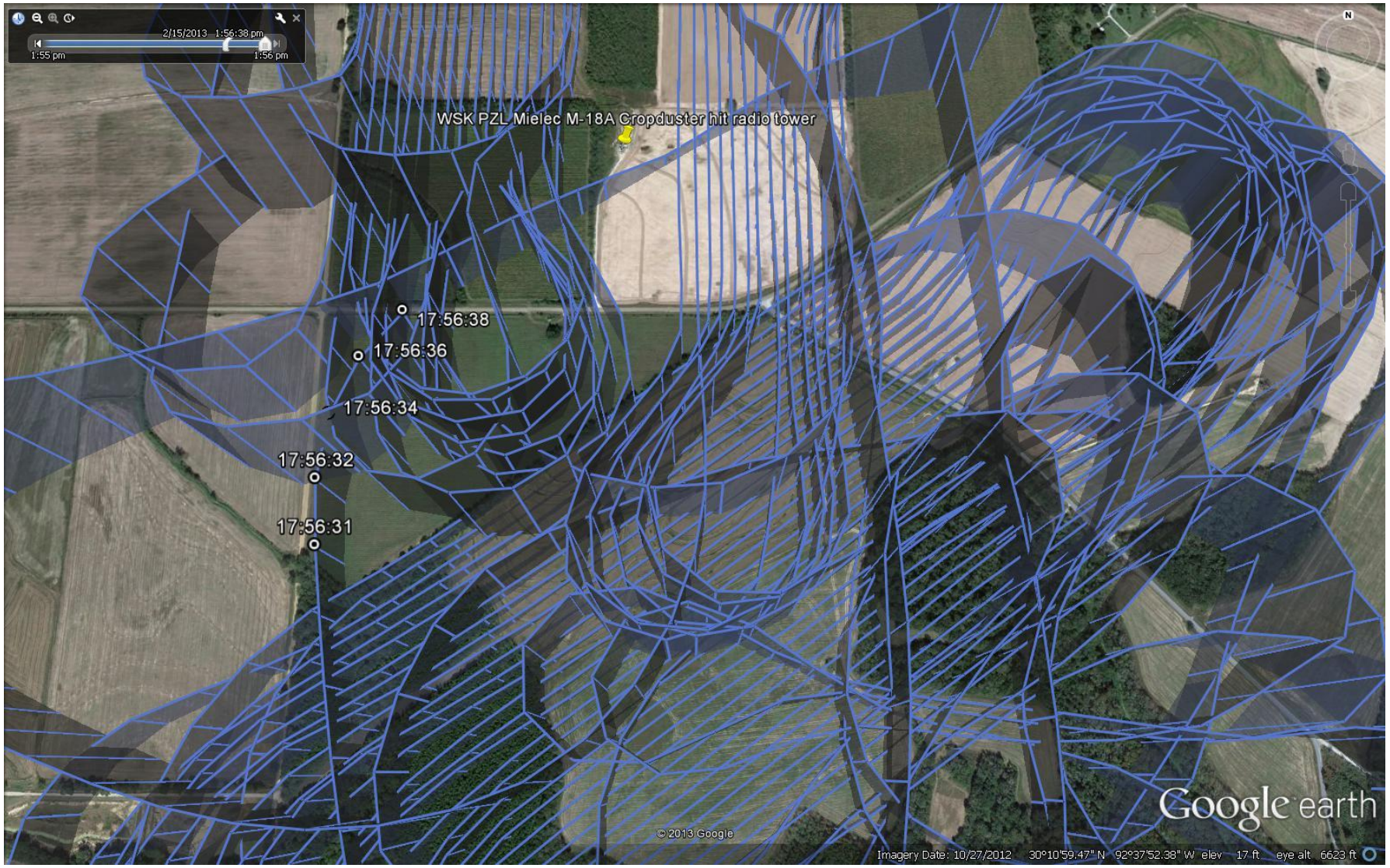


Figure 6. Google Earth overlay of end of recording.

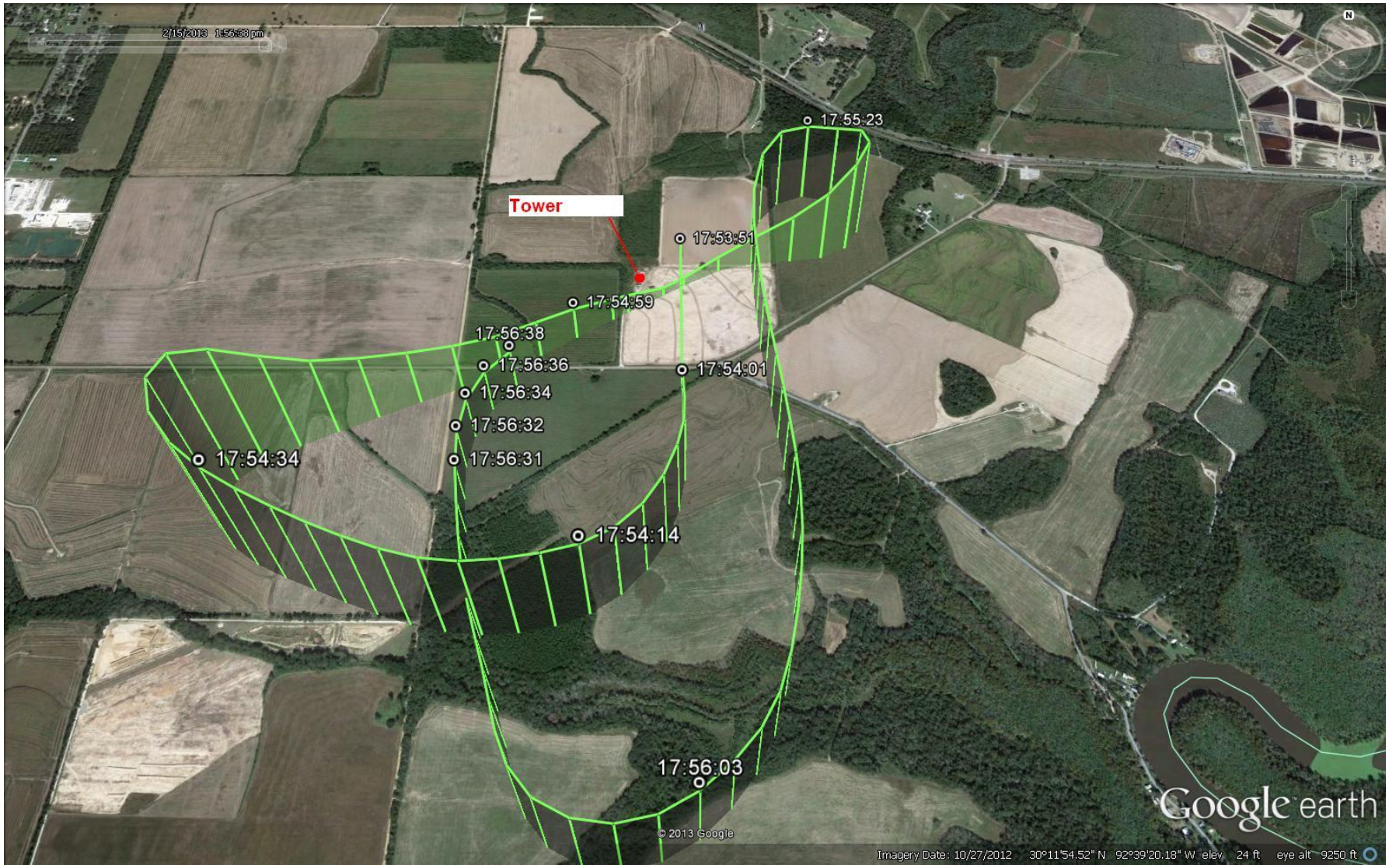


Figure 7. Plot of parameters near the end of the recording.

Riceland Aviation, Inc., WSK PLZ M-18A, Recorded by SatLoc G4, N4305D