

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

May 24, 2018

Global Positioning System Device

Specialist's Factual Report

By Sean Payne

1. EVENT SUMMARY

Location: Marydel, Delaware
Date: July 19, 2017
Aircraft: Grumman G164
Registration: N691Y
Operator: Air Enterprises, Inc.
NTSB Number: ERA17LA249

On July 19, 2017, about 0920 eastern daylight time, a Grumman G164 airplane, N691Y, was substantially damaged when it struck power lines and impacted a soybean field near Marydel, Delaware. The commercial pilot was seriously injured. The airplane was registered to and operated by Air Enterprises, Inc., as a 14 *Code of Federal Regulations* part 137 aerial application flight. Visual meteorological conditions prevailed at the accident site and no flight plan was filed for the flight that departed Johnson's Airport (DE09), Magnolia, Delaware, about 0910.

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 P151
Serial Number:	15180825

3.1. Device Description

The AgNav Guia P151 is a compact GPS device used to provide pilot's customizable agricultural spray application data on a color moving map. The unit has a 6.5 inch 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 can interface with an agricultural "light bar" that provides

directional guidance to the pilot as per user defined aerial application position information. The device has an obstacle warning feature which is compatible with FAA tower obstacle data and provides pilots warnings regarding incoming obstacles via messages and alarms.

3.2. Data Recovery

The device was undamaged and data was downloaded normally via a PC using the manufacturer's supplied software. Raw data was then converted to a text file using the software, and later to other formats.

3.3. Data Description

The device contained a number of files associated with flights consistent with agricultural aerial application. One file, "PFSandtowneast" was recorded on the accident day and contained the accident flight. Data for the accident flight began at 11:37:29 and ended at 13:21:01. Times are provided in Universal Coordinated Time (UTC).

3.4. Parameters Provided

Table 1 describes data parameters provided by the GPS device. Date, Time, Latitude, Longitude, GPS Altitude 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
Date	Date for recorded data point (MM/DD/YYYY)
Time	Time (UTC) for recorded data point (HH:MM:SS.00)
LAT	Recorded Latitude (degrees)
LON	Recorded Longitude (degrees)
ALTft	Recorded GPS Altitude (feet)
SPkts	Average derived groundspeed (knots)
HEAD	Average derived ground track (degrees, true)
SPRY	Spray Condition (0=OFF, 1=ON)

3.5. OVERLAYS AND TABULAR DATA

Figure 1 is a graphical overlay generated using Google Earth for the accident flight directly from the manufacturer's software. Pink areas show regions of aerial application. A red outline shows the aerial application boundary that the user set in the Agnav device. 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 2 is a graphical overlay generated using Google Earth for the accident flight directly from the manufacturer's software. It shows a detailed view of the area of aerial application. Altitude is not depicted

Figure 3 is a graphical overlay generated using Google Earth for the accident flight generated using NTSB software tools. The aircraft's altitude above ground is depicted. At some times, the recorded GPS altitude crosses below the WGS84 geodesic bound and appears under the earth's surface. This is a result of WGS84 calculating the earth's surface based on a geoid.

Figure 4 is a graphical overlay generated using Google Earth for the accident flight generated using NTSB software tools. The aircraft was returning from DE09 on its first application pass headed west. Data was lost at 13:21:01.

Tabular data used to generate figures 2 through 6 are included as Attachment 1. This attachment is provided in electronic comma-delimited (.CSV) format].

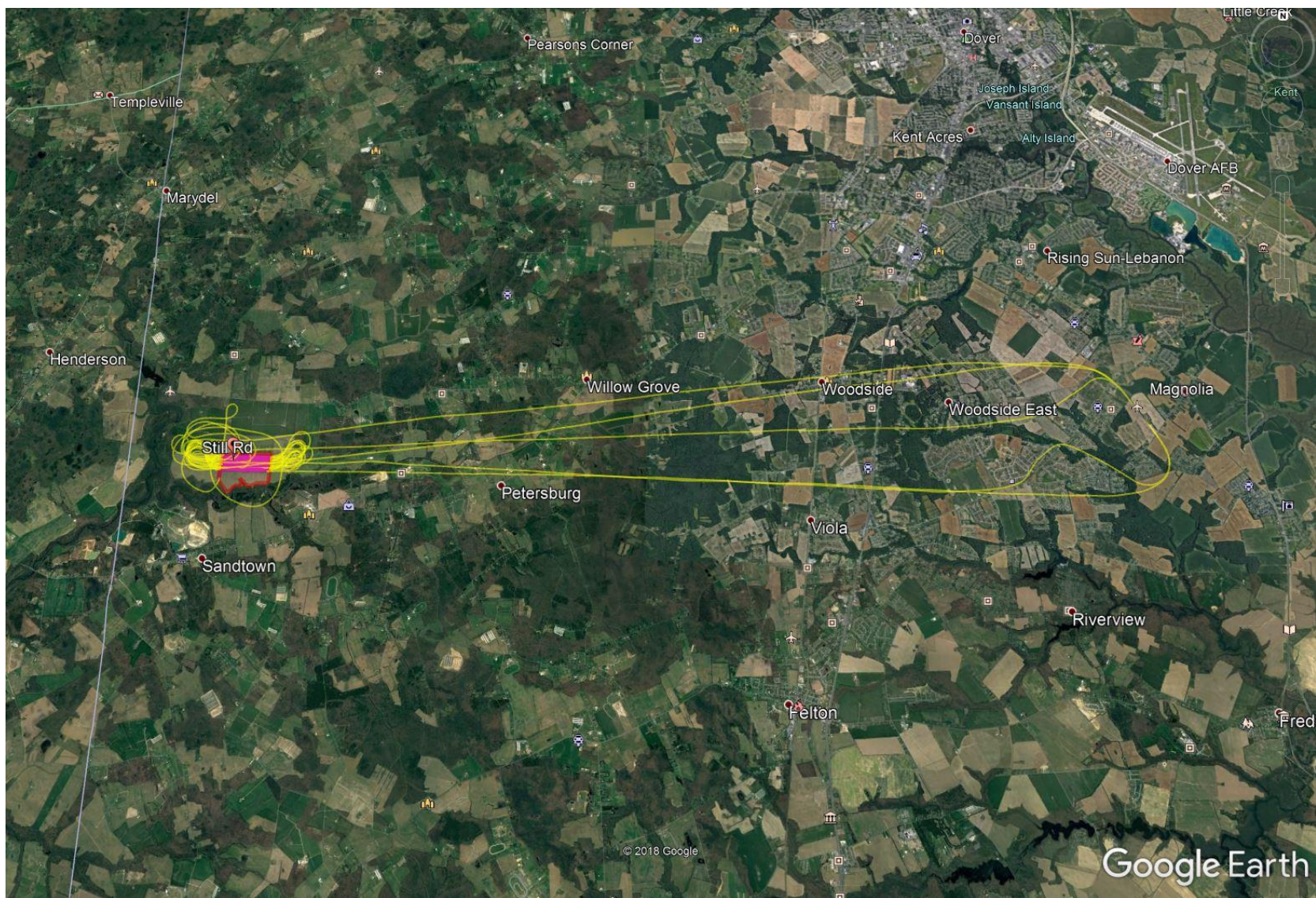


Figure 1. Google Earth overlay showing the entire flight.

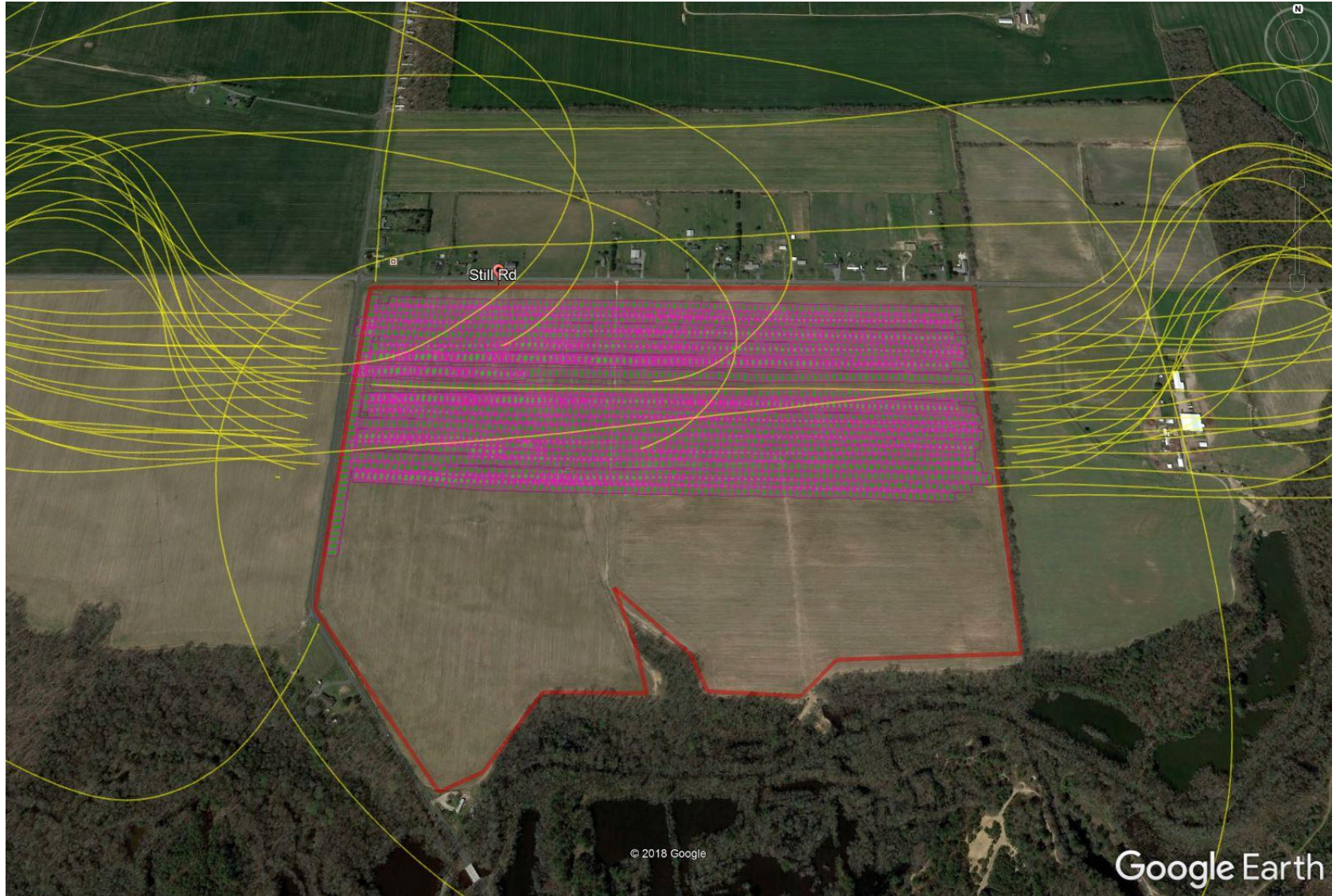


Figure 1. Google Earth overlay showing the region of aerial application.



Figure 3. Google Earth overlay showing a detailed view of the aircraft's altitude over the application area.

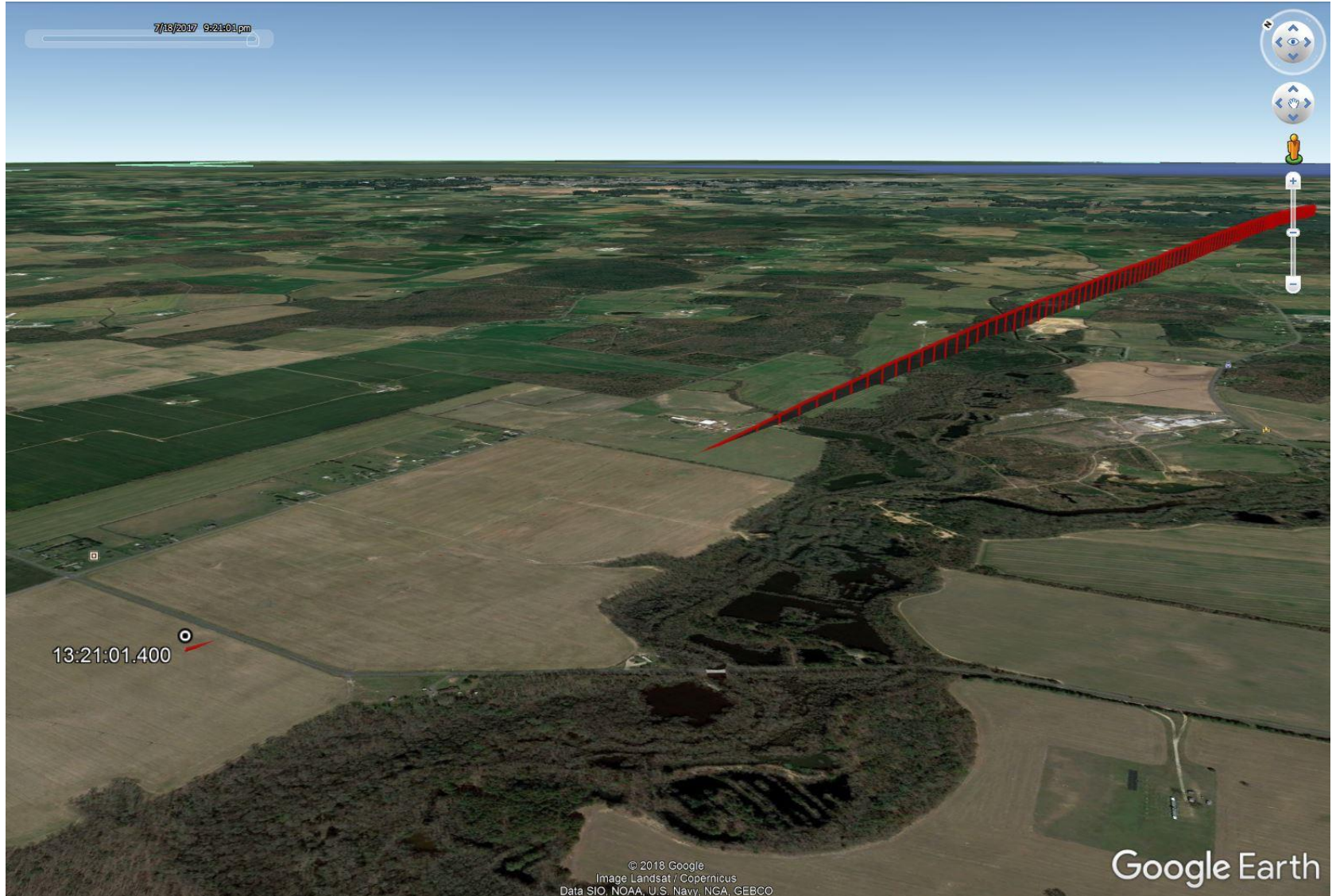


Figure 4. Google Earth overlay showing only the accident application pass and the last recorded GPS data point.