

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

October 20, 2014

Global Positioning System (GPS) Device

Specialist's Factual Report

by Sean Payne

1. EVENT

Location: Senoia, Georgia
Date: August 9, 2014
Aircraft: Cessna 150C
Registration: N7968Z
Operator: Private
NTSB Number: ERA14FA377

2. GROUP

A group was not convened.

3. SUMMARY

On August 9, 2014, about 0600 eastern daylight time, a Cessna 150C, N7968Z, owned and operated by a private individual, was destroyed when it impacted terrain shortly after takeoff from Atlanta Regional Airport-Falcon Field (FFC), Peachtree City, Georgia. The private pilot and a passenger were fatally injured. Instrument meteorological conditions prevailed and no flight plan had been filed for the flight destined for Eagle Neck Airport (1GA0), Shellman Bluff, Georgia. The personal flight was conducted under the provisions of 14 *Code of Federal Regulations* Part 91.

4. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Laboratory received the following device:

GPS Manufacturer/Model: **Garmin Aera 550**
Serial Number: **1QS001227**

4.1. Garmin Aera 550 Device Description

The Garmin Aera 550 is a portable GPS navigation device employing a 4.3 inch touch-screen and color moving map display. The Aera is capable of interfacing with the Garmin GTX 330 Mode S transponder to display TIS traffic alerts. The Aera is capable of storing track logs that contain position location information for an unspecified number of points in non-volatile memory. This data is stored internally in an industry-standard format and may be transferred to a PC running Windows Explorer via USB. The device also contains a terrain and obstacle database and displays a TAWS-like color coded display to show alert the user of obstructions or ground proximity conflicts that are projected for the aircraft's flight path.

4.2. Garmin Aera 550 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed that the unit had sustained no significant damage. The unit was powered up using the device's battery and tracklog data downloaded normally to a PC running Garmin MapSource communicating with the unit via the built-in USB port. Figure 1 shows the condition of the unit shortly after it arrived in the laboratory.

Figure 1. The front and back of the Garmin Aera 550.



The unit functioned normally and the device's various pages were displayed in the laboratory. Upon startup, the device indicated that the "Americas Aviation Data 1102, US SafeTaxi 11S1 and US Onstacles 11B1" databases had all expired March 10, 2011. The active flight plan page showed that the user had programmed in a direct-to waypoint for Eagle Neck Airport (1GA0), Shellman Bluff, Georgia. The time at which this waypoint was entered by the user could not be determined. Figure 2 shows the Active Flight Plan screen in which the waypoint is shown.

Figure 2. The Active Flight Plan page of the Garmin Aera 550.



4.3. Garmin Aera 550 Data Description

The data extracted from Garmin Aera 550 included tracklog data recorded between June 20, 2014, and August 9, 2014 from 45 different power cycles. The entire tracklog contained a total of 10,002 data points. The session recorded on August 9, 2014, contained 74 data points and was found to be from a single flight. This flight was subsequently determined to be the accident flight. All times in this report are in Universal Coordinated Time (UTC).

5. GPS Parameters Provided

Table 1 describes data parameters provided by the Garmin Aera 550. Date, Time, Latitude, Longitude and GPS Altitude 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 of recorded data point (MM/DD/YYYY)
Time	Time of recorded data point (UTC) (HH:MM:SS)
Latitude	Recorded Latitude (degrees)
Longitude	Recorded Longitude (degrees)
GPS alt	GPS Altitude (feet)
Groundspeed	Average groundspeed from previous data point (knots) - Derived
Track	Average ground track from previous data point (degrees true) - Derived

6. OVERLAYS AND TABULAR DATA

All graphical overlays generated in this report were generated using Google Earth in North-Up format. Selected time information is displayed in UTC.

Figure 3 is a Google Earth Overlay showing a top down and north up overview of all the recorded tracklog information from the August 9th, 2014 recording. Selected times and associated data values are displayed during chosen portions of the recording.

Figure 4 is a Google Earth overlay which shows the aircraft's takeoff roll and downwind departure from Atlanta Regional Airport-Falcon Field (FFC), Senoia, Georgia.

Figure 5 is a Google Earth overlay showing a southwesterly turn the aircraft made shortly before it impacted terrain.

Figure 6 is a Google Earth overlay which shows the aircraft's final portion of flight and subsequent impact with terrain.

The session on August 9th, 2014 showed that data recording began in the ramp area of Atlanta Regional Airport-Falcon Field (FFC), Senoia, Georgia at 09:39:52 UTC. At 09:48:24, data shows the aircraft on takeoff roll departing Runway 31. The aircraft made a left turnout after departure and climbed to 1,191 feet. When turning downwind toward the southeast, the aircraft lost altitude briefly. The aircraft climbed and continued on a southeasterly heading where its altitude was shown between approximately 1,100 and 1,800 feet. Around 09:53:28, the aircraft began a right turn from 1,368 feet toward a westerly heading. Finally, at 09:54:26 at an altitude of 1,227 feet and a derived groundspeed of 99 knots, the aircraft began a slight left descending left turn toward the impact location. During this time, the data showed a maximum recorded groundspeed of 123 knots. At 09:54:40, the aircraft was shown with an altitude of 823 feet and a groundspeed of 116 knots in the immediate vicinity of a high tension power line area approximately 3.25 NM southeast of the departure airport. At 09:54:51 UTC, data showed the aircraft's altitude had been degraded to a value roughly matching the topographic region. At this time, the aircraft's altitude had been reduced to 659 feet and derived groundspeed was shown as 19 knots. The last recorded data point was taken at 09:55:12 in the immediate vicinity of the wreckage location and recorded the aircraft at a derived groundspeed of 2 knots. This last recorded groundspeed value may be unreliable due to the device's sampling rate and the way it derives the groundspeed parameter using averaging.

The tabular data used to generate figure 3 through 6 are included as Attachment 1 to this report. This attachment is provided in electronic comma-delimited (.CSV) format.

Figure 3. A Google Earth Overlay showing a top down, north up overview of all the recorded tracklog information during the accident flight.

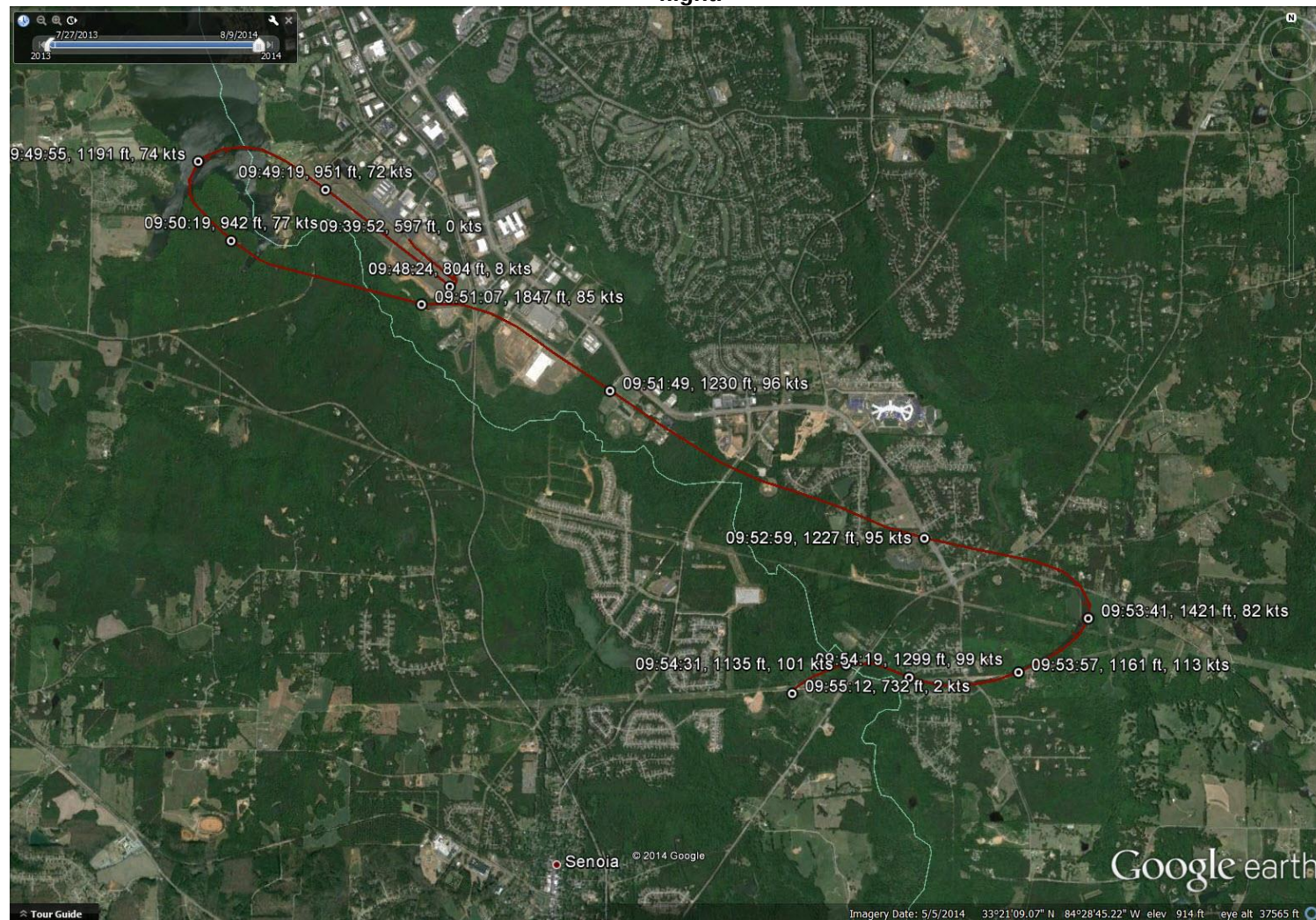


Figure 4. A Google Earth overlay showing the aircraft's departure sequence.

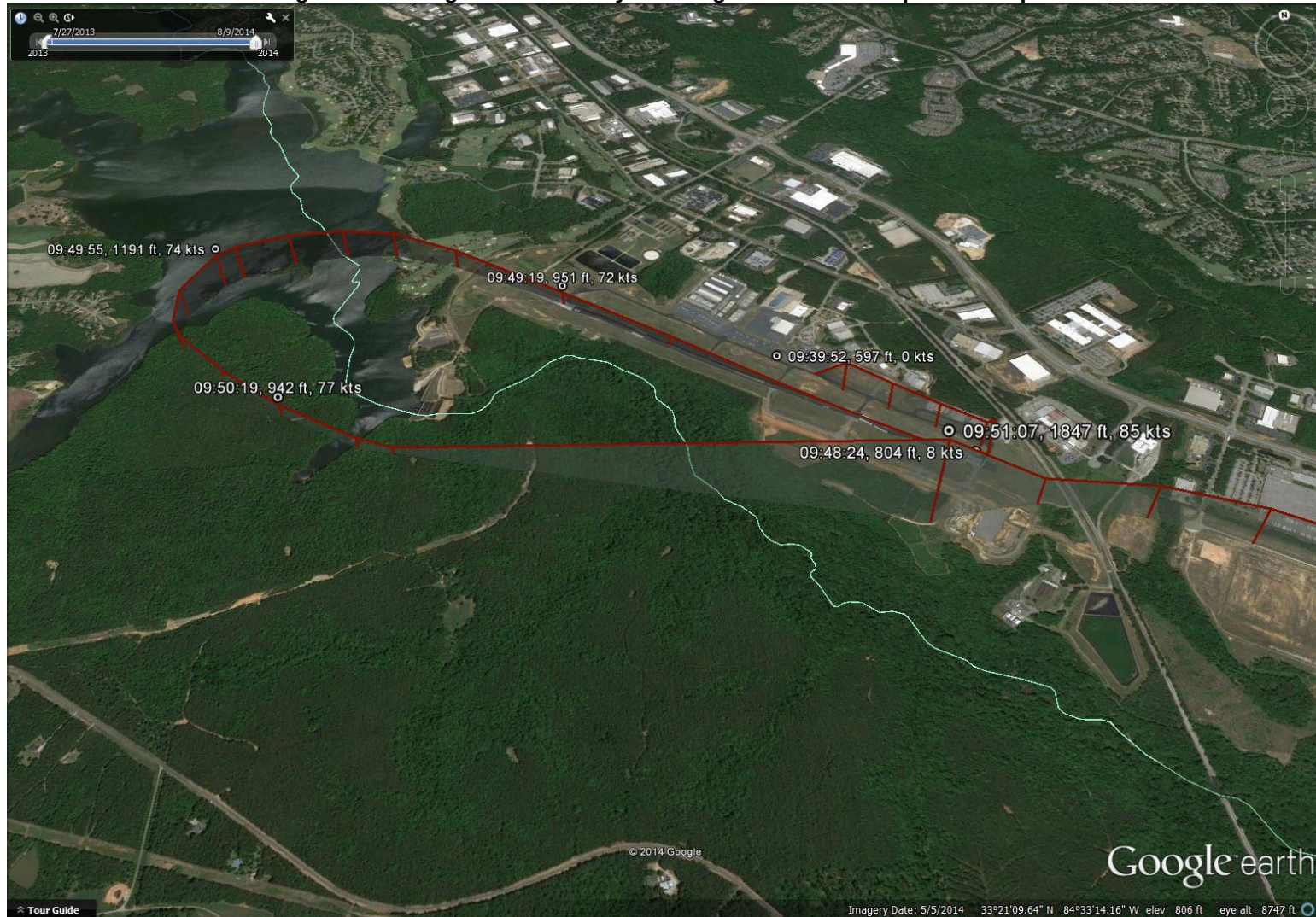


Figure 5. A Google Earth overlay showing a southwesterly turn that was made shortly before impact with terrain.

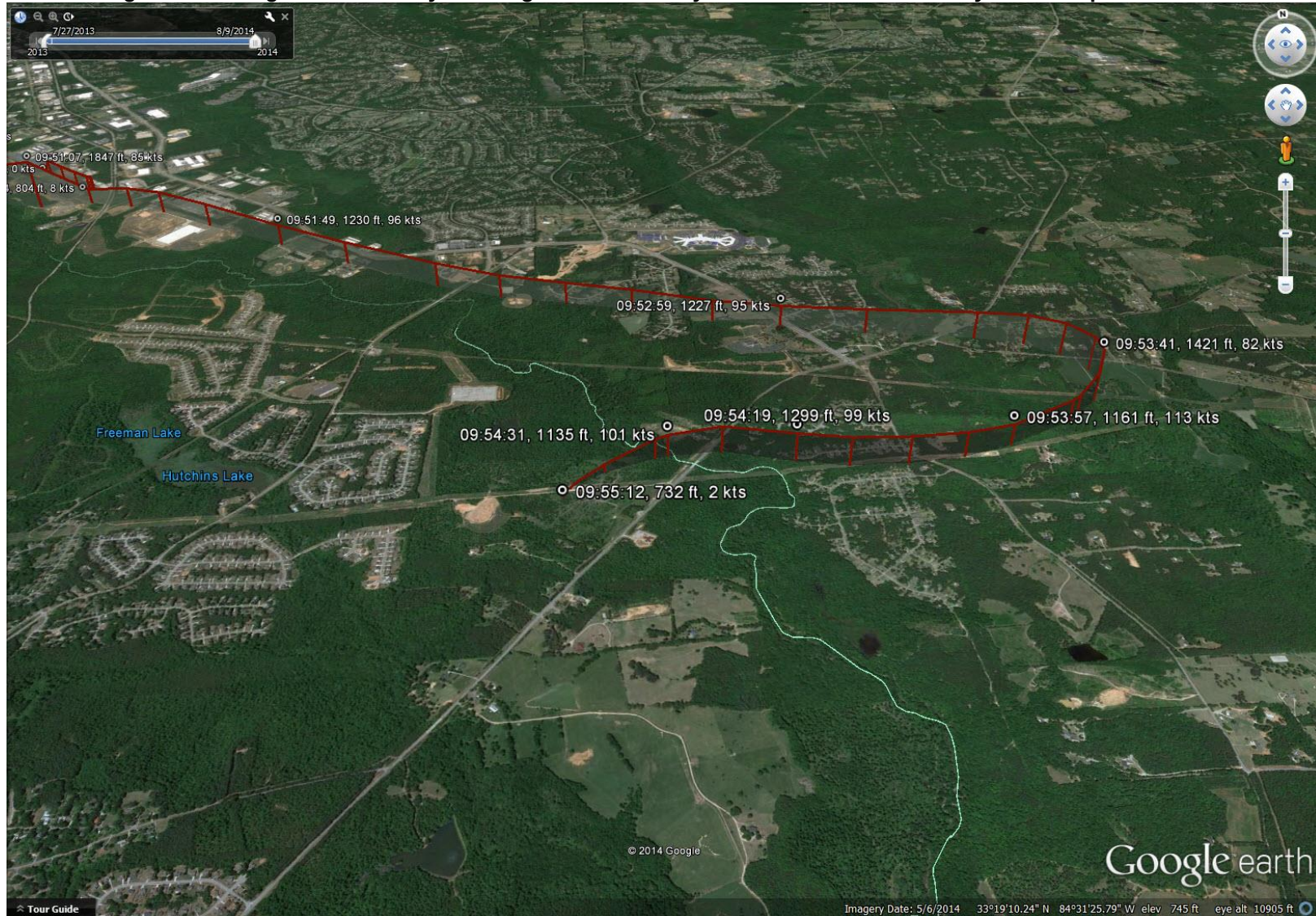


Figure 6. A Google Earth overlay showing the final portion of flight.

