

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

April 1, 2013

GPS Factual Report

**Specialist's Factual Report
by Bill Tuccio**

A. EVENT

Location: Corning, New York
Date: November 15, 2012
Aircraft: Hughes 369D
Registration: N369AW
Operator: Haverfield Aviation Inc.
NTSB Number: ERA13LA057

B. GROUP - No Group

C. SUMMARY

On November 15, 2012, at 1211 eastern standard time, a Hughes 369D (MD 500D), N369AW, operated by Haverfield Aviation Inc., was substantially damaged following a collision with power lines and terrain in Corning, New York. The commercial pilot and a passenger were fatally injured. Visual meteorological conditions prevailed and no flight plan had been filed for the flight that departed the Elmira-Corning Regional Airport (ELM), Horseheads, NY, about 1145. The aerial observation flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

D. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Laboratory received the following device:

GPS Manufacturer/Model: Garmin GPSMAP 496
Serial Number: 19729812

Garmin GPSMAP 496 Device Description

The Garmin GPSMAP 496 is a battery-powered portable 12-channel GPS receiver with a 256-color TFT LCD display screen. The unit includes a built-in Jeppesen database and is capable of receiving XM satellite radio for flight information including NEXRAD radar, lightning, METARs, TAFs, and TFRs. The unit stores date,

route-of-flight, and flight-time information for up to 50 flights. A flight record is triggered when groundspeed exceeds 30 knots and altitude exceeds 500 feet, and ends when groundspeed drops below 30 knots for 10 minutes or more. A detailed tracklog – including latitude, longitude, date, time, and GPS altitude information for an unspecified number of points – is stored within the unit whenever the receiver has a lock on the GPS navigation signal. Position is updated within the tracklog as a function of time or distance moved, depending on how the unit has been configured. Once the current tracklog memory becomes full, new information either overwrites the oldest information or the recording stops, depending on how the unit is configured. The current tracklog can be saved to long-term memory and 15 saved tracklogs can be maintained in addition to the current tracklog. Tracklog storage may be activated or de-activated at user discretion. All recorded data is stored in non-volatile memory¹. The unit contains hardware and software permitting the download of recorded waypoint, route, and tracklog information to a PC via a built-in serial port using the NMEA 0183 version 2.0 protocol. The unit can also communicate with external devices such as a computer using a built in USB port. An internal button-battery is used to back-up power to the internal memory and real-time clock during those periods when main power is removed.

GPS Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed that the unit had not sustained any damage. Power was applied to the accident unit and it started normally. Data was downloaded from the unit using Garmin supplied software normally, without difficulty.

GPS Data Description

The data extracted spanned the period from November 2, 2012² through November 15, 2012 at 17:11:57 UTC, a total of 10,002 data points. The accident flight was recorded starting at 16:43:28 UTC and ending at 17:11:57 UTC on November 15, 2012.

GPS Parameters Provided

Table 1 describes data parameters provided by the GPS device. Date, Time, Latitude, Longitude, and GPS Altitude are recorded by the device. Groundspeed and Track are derived from the recorded parameters.

¹ Non-volatile memory is semiconductor memory that does not require external power for data retention

² All dates and times are referenced to Coordinated Universal Time (UTC).

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)
Latitude	Recorded Latitude (degrees)
Longitude	Recorded Longitude (degrees)
GPS Alt	Recorded Altitude, (above Mean Sea Level) (feet)
Groundspeed	Average groundspeed between current and previous data point (knots)
Track	Average true course between current and previous data point (degrees)

OVERLAYS AND TABULAR DATA

The figures are graphical overlays generated using Google Earth of the accident flight. All times are UTC and all altitudes are GPS recorded altitude above mean sea level.

Figure 1 shows the entire accident flight, annotated for directionality. The recording began at 16:43:28 UTC at the ELM airport. The aircraft began to climb out of ELM about 16:47:56 UTC. After an initial climb to the northwest, the aircraft proceeded southwesterly for about 4 nautical miles (annotated leg number 1). The aircraft then went south over interstate 86, then turned back north (annotated leg number 2). The aircraft then proceeded northeasterly, before proceeding about 1.5 nautical miles northwesterly, and then returning southeasterly along the same route (annotated leg number 3). By about 17:07:10 UTC, the aircraft was proceeding westerly, north of interstate 86 (annotated leg number 4).

Figure 2 shows the end of the accident flight recording. Between 17:10:11 UTC and 17:10:31 UTC, two data points were recorded, with one of the altitudes recorded at 1,365 feet. These two points are not shown and the validity of these altitudes could not be determined.

From 17:10:11 UTC until about 17:10:44 UTC, the aircraft proceeded northeasterly along the top of a ridgeline. At about 17:10:44 UTC, the aircraft proceeded southwesterly, crossing interstate 86 at about 17:11:12 UTC at a GPS recorded altitude of 1,237 feet. South of interstate 86, at 17:11:27 UTC, the GPS recorded altitude was 1,014 feet. The last two recorded points were both at a GPS recorded altitude of 1,010 feet, at 17:11:34 UTC and 17:11:57 UTC. The calculated track and groundspeeds of the last few points may not be valid due to the limited sampling rate of the recorded data.

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

Figure 1. Google Earth overlay of the accident flight (annotated).

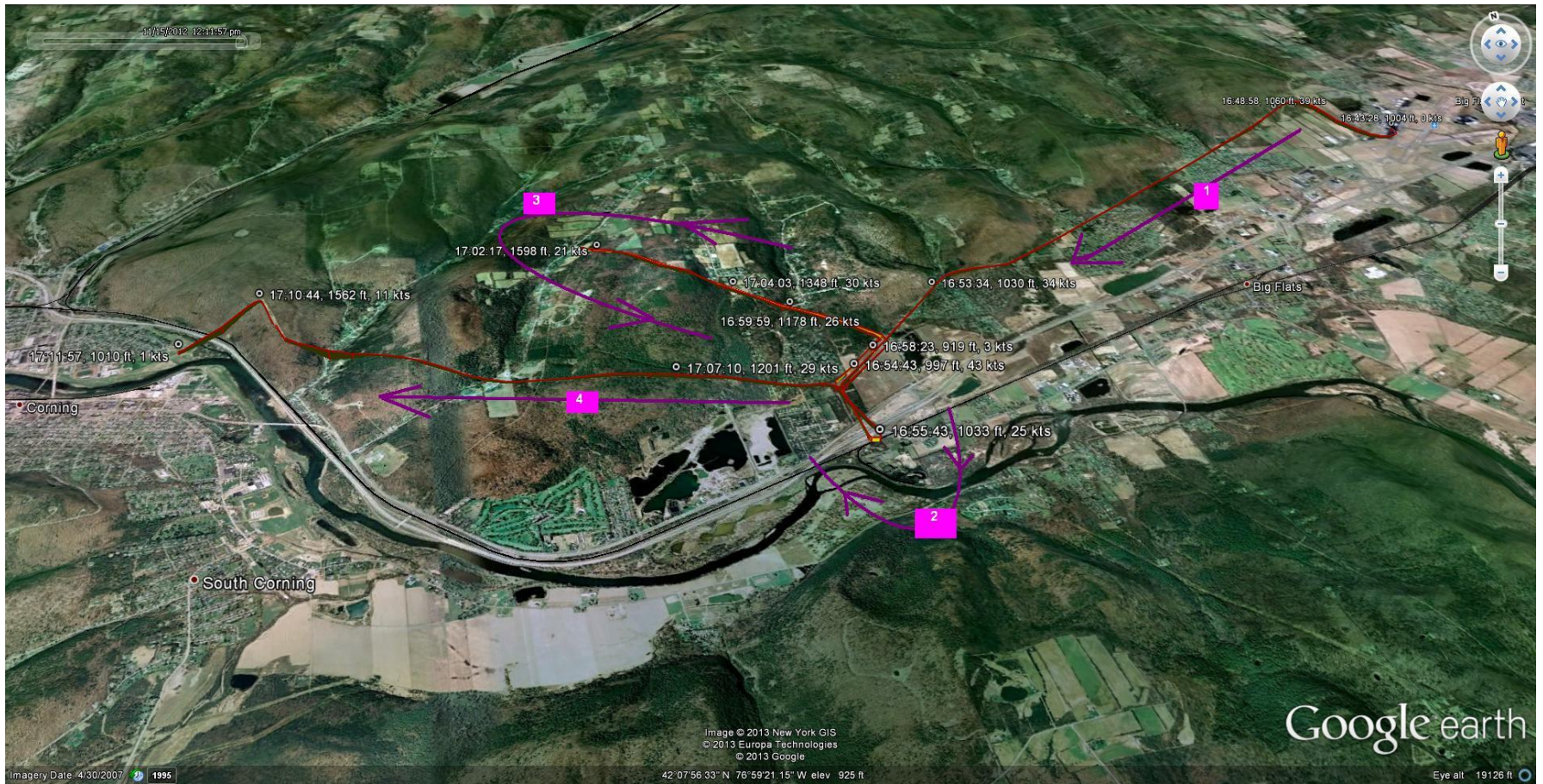


Figure 2. Google Earth overlay of the end of the flight.

