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

August 11, 2015

Global Positioning System (GPS) Device

Specialist's Factual Report
by Sean Payne

1. EVENT

Location:	Spring City, Pennsylvania
Date:	June 15, 2014
Aircraft:	Cameron Balloons Z-225
Registration:	N65625
Operator:	The United States Hot Air Balloon Team
NTSB Number:	ERA14LA290

2. GROUP

A group was not convened.

3. SUMMARY

On June 15, 2014, about 0716 eastern daylight time (EDT), a Cameron Balloons US Z-225 balloon, N65625, had the commercial-rated pilot receive fatal injuries when he fell from the basket during landing in a field near Spring City, Pennsylvania. The 10 passengers were not injured. There was no damage to the basket or envelope. The balloon was registered to Morning Star Visions, and operated by The United States Hot Air Balloon Team under the provisions of 14 *Code of Federal Regulations* Part 91 revenue sightseeing flight. Visual meteorological conditions prevailed at the time and no flight plan was filed for the flight that originated about 0636 EDT from Pottstown Municipal Airport, Pottstown, Pennsylvania.

4. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Laboratory received the following device:

GPS Manufacturer/Model:	**Garmin GPSMAP 62s**
Serial Number:	**21F081390**

4.1. Garmin GPSMAP 62s Device Description

The Garmin GPSMAP 62s is a hand-portable GPS unit equipped with a 2.6 inch color LCD display, soft-key controls, and built in antenna. The GPSMAP 62s features a 3 axis compass with barometric altimeter. The unit can be operated using external power, or alternatively by using a set of 2 internally mounted AA batteries. The GPSMAP 62s is capable of storing position and altitude information for up to 2000 waypoints in non-volatile[1] memory. Up to 200 routes may also be stored in memory. A detailed tracklog – composed of latitude, longitude, date, time, altitude, and derived groundspeed information can also be stored. Tracklog storage may be activated or de-activated at user discretion. The unit contains hardware and software permitting the download of recorded waypoint, route, and tracklog information to a PC via a built-in USB port.

4.2. Garmin GPSMAP 62s 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 two AA batteries 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 GPS in its arrival state at the laboratory.

Figure 1. The arrival condition of the Garmin GPSMAP 62s.

4.3. Garmin GPSMAP 62s Data Description

The data extracted from Garmin GPSMAP 62s included data recorded between May 29, 2014, until June 15, 2014 from 7 different flights. The entire tracklog contained a total of 7,610 data points. The session recorded on June 15, 2014 contained 847 data points and was found to be from a single flight. This flight was subsequently determined to be the

[1] Non-volatile memory (NVM) is semiconductor memory that does not require external power for data retention.

accident flight. All times in this report are in Universal Coordinated Time (UTC) followed by their respective time in EDT.

4.4. GPS Parameters Provided

Table 1 describes data parameters provided by the Garmin GPSMAP 62s.

Table 1: GPS Data Parameters

Parameter Name	Parameter Description
Date	Date of recorded data point
Time	Time of recorded data point (UTC)
Latitude	Recorded Latitude (degrees)
Longitude	Recorded Longitude (degrees)
GPS alt	GPS Altitude (feet)
Groundspeed	Average groundspeed from previous data point (knots)
Track	Average ground track from previous data point (degrees true)

4.5. Overlays and Tabular Data

All graphical overlays generated in this report were generated using Google Earth. All overlays are provided in a north up orientation.

Figure 1 is a Google Earth Overlay showing the overall route of flight after departing Pottstown Municipal Airport (N47), Pottstown, PA.

Figure 2 is a Google Earth overlay showing the balloon's descent into the selected landing area.

Figure 3. is a Google Earth overlay showing a detailed view of the balloon's descent into the selected landing area.

The session on June 15, 2014 showed the balloon lifted off from the ramp area of Pottstown Municipal Airport (N47), Pottstown, PA around 10:36 UTC (06:36 EDT). The data shows the balloon was in a slow climb as it traveled east of the airport. Around 10:54 UTC (06:54 EDT), the balloon began traveling in a more southeasterly direction along the Schuylkill River. At 10:58:54 UTC (06:58:54 EDT), the balloon reached its maximum GPS recorded altitude of 1,476 feet. Around 11:11:51 UTC (07:11:51 EDT), the balloon began a steady descent from 1,280 feet toward a cluster of fields along the Schuylkill River. In the final portion of flight, the balloon crossed a road at 282 feet GPS altitude with 11 knots of groundspeed. Data shows the balloon steadily descended into a field with a forward speed of about 10 knots. The balloon came to rest at 11:17:09 UTC (07:17:09 EDT) when the groundspeed was recorded as 0 knots. The GPS continued to log a stationary location until 14:36:51 UTC (10:36:51 EDT) when the recording terminated.

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

Figure 1. A Google Earth overlay showing the overall route of flight after departing Pottstown Municipal Airport (N47), Pottstown, PA.

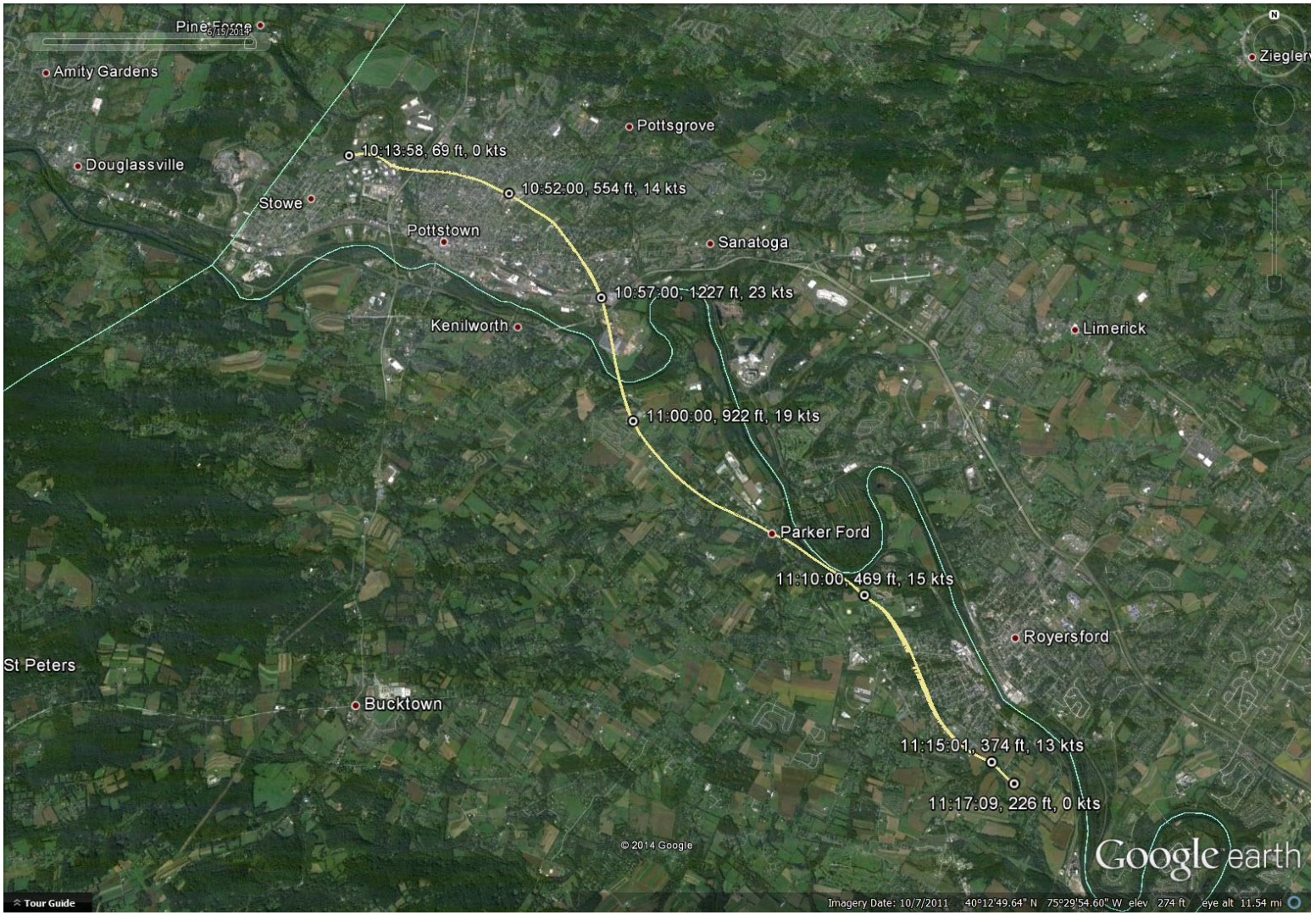

Figure 2. A Google Earth overlay showing the balloon's descent into the selected landing area.

Figure 3. A Google Earth overlay showing a detailed view of the balloon's descent into the selected landing area.