

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

August 29, 2013

17 - GPS Factual Report

by Sean Payne

1. EVENT

Location: Taos, New Mexico
Date: May 10, 2013, 12:34 Mountain Standard Time (MST)¹
Aircraft: Zenith 250
Registration: N250ZP
Operator: Private
NTSB Number: CEN13LA273

1.1 GROUP - No Group

1.2 SUMMARY

On May 10, 2013, about 12:34 Mountain Standard Time, a Phillips Zenith 250, N250ZP, collided with terrain after departing Taos Regional Airport (KSKX), Taos, New Mexico. The pilot, the sole occupant of the airplane, received serious injuries. The airplane received substantial damage to both wing spars, the forward fuselage, and the engine firewall. The airplane was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which operated without a flight plan. The flight was originating at the time of the accident.

2. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Laboratory received the following device:

GPS Manufacturer/Model: Garmin GPSMAP 295
Serial Number: 98821403

¹ All times in the remainder of this report are given in Mountain Standard Time (MST), unless otherwise noted.

2.1. Garmin GPSMAP 295 Device Description

The Garmin GPSMAP 295 is a hand-portable GPS unit equipped with a 16-color LCD display, soft-key controls, and employs a 12-channel receiver. The unit can be operated using external power, or alternatively by using a set of 6 internally mounted AA batteries. An external antenna, attached via a BNC-style connector, is required for normal operation. The GPSMAP 295 is capable of storing position and altitude information for up to 500 waypoints in non-volatile² memory. Twenty routes, each representing a linked list of up to 30 waypoints, may also be stored in memory. A detailed tracklog – composed of latitude, longitude, date, time, altitude, and groundspeed information for approximately 1000 separate data points – can also be stored. tracklog storage may be activated or deactivated 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 serial port using the NMEA 0183 version 2.0 protocol. 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.

2.2. Garmin GPSMAP 295 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 and track data downloaded normally to a PC running Garmin MapSource communicating with the unit via the built-in serial port.

2.3. Garmin GPSMAP 295 Data Description

The data extracted from Garmin GPSMAP 295 included data recorded on 5 different days from 5 different power cycles. The 5 power cycles contained a total of 1,022 data points. The session recorded on May 10, 2013 contained 45 data points and was found to be from a single flight. This flight was subsequently determined to be the accident flight.

The session on May 10, 2013 shows the aircraft taxiing to and departing from Runway 04 at Taos Regional Airport (KSKX), Taos, NM (Figure 1). The data shows the aircraft climbing slowly as it performs a right turn shortly after departure (Figure 2). The aircraft begins losing altitude and turns to the southwest. The data log ends as the aircraft encounters terrain near Verdolaga Rd (Figure 3).

3. GPS Parameters Provided

Table 1 describes data parameters provided by the Garmin GPSMAP 295.

² Non-volatile memory is semiconductor memory that does not require external power for data retention.

Table 1: GPS Data Parameters

Parameter Name	Parameter Description
Date	Date of recorded data point
Time	Time of recorded data point (GMT)
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. OVERLAYS AND TABULAR DATA

All graphical overlays generated in this report were generated using Google Earth. No time information is displayed.

Figure 1 is a graphical overlay generated using Google Earth zoomed in to show the departure sequence of the accident flight.

Figure 2 is a graphical overlay generated using Google Earth zoomed out to show the aircraft's entire flight.

Figure 3. is a graphical overlay generated using Google Earth zoomed in to show the flight's final waypoints.

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 aircraft departing Runway 04 at Taos Regional Airport (KSKX), Taos, NM.



Figure 2. A Google Earth overlay showing the entire tracklog from the accident flight.



Figure 3. A Google Earth overlay showing the aircraft's final waypoints ending near Verdolaga Rd.

