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

April 4, 2019

Global Positioning System Device

Specialist's Factual Report
By Christopher Babcock

1. EVENT SUMMARY

Location:	Yukon, Oklahoma
Date:	March 18, 2019
Aircraft:	Israel Aerospace Industries Westwind 1124
Registration:	N4MH
Operator:	Sundance Airport FBO LLC
NTSB Number:	CEN19FA104

On March 18, 2019, at 1537 central daylight time, an Israel Aircraft Industries Westwind 1124, N4MH, impacted terrain near the east side of runway 18 at Sundance Airport (HSD), Yukon, Oklahoma. The airplane was destroyed. Both pilots sustained fatal injuries. The airplane was registered to and operated by Sundance Airport FBO LLC under Title 14 *Code of Federal Regulations* Part 91. The flight was operating on an instrument rules flight plan. Visual meteorological conditions prevailed at the time of the accident. The flight departed from Northwest Florida Beaches International Airport (ECP), Panama City, Florida and was destined to HSD.

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:	Garmin GPSMAP 496
Serial Number:	19719630

3.1. Device Description

The Garmin GPSMAP 496 is a battery-powered portable 12-channel GPS receiver. The unit includes a built-in Jeppesen database and can receive XM satellite radio for flight information including NEXRAD radar, lightning, METARs, and TFRs. A detailed tracklog including latitude, longitude, date, time, and GPS altitude information 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 recording stops, depending on how the unit is configured. Tracklog storage may be activated or de-activated at user discretion. All recorded data is stored in non-volatile memory (NVM). [1] 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. 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.

3.2. Data Recovery

The GPS exhibited some signs of impact damage including a broken screen. Data was extracted normally through the manufacturer's software.

Figure 1. Garmin GPSMAP 496, as received.

3.3. Data Description

The data extracted included 40 track logs from February 2, 2019, through March 18, 2019.[2] Not all track logs were associated with an actual flight. The accident flight was recorded starting 1820 UTC and ending 2037:30 UTC on March 18, 2019.

3.4. 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] NVM is semiconductor memory that does not require power to retain information
[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 GPS Altitude (feet)
Groundspeed	Average derived groundspeed (knots)
Track	Average derived true course (degrees)

3.5. OVERLAYS AND TABULAR DATA

Figure 2 is a graphical overlay generated using Google Earth for end of the accident flight. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

The last recorded parameter was as at 2037:30 UTC on March 18, 2019, with a GPS altitude of 1194 feet above Mean Sea Level (MSL) and a ground speed of 109 knots. Due to data buffering on the GPS unit, the data recording may have ended before the accident event.

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

Figure 2. Google Earth overlay showing end of accident flight.