

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

July 20, 2020

Other Electronic Devices

Specialist's Factual Report by Christopher Babcock

1. EVENT

Location: Mayport, Florida
Date: December 20, 2018
Aircraft: Piper PA-46-350P
Registration: N307JM
Operator: Private
NTSB Number: ERA19LA072

On December 20, 2018, about 0904 eastern standard time, a Piper PA-46-350P, N307JM, impacted the Atlantic Ocean near Mayport, Florida. The private pilot and pilot-rated passenger were fatally injured. The airplane was destroyed. The airplane was privately owned and operated under the provisions of Title 14 *Code of Federal Regulations* Part 91. Instrument meteorological conditions prevailed at the time and the flight was operating on an instrument flight rules (IFR) flight plan. The personal flight originated from Kissimmee Gateway Airport, Orlando, Florida, about 0821, and was destined for Princeton Airport, Princeton/Rocky Hill, NJ.

2. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following devices:

Device 1: Garmin GPSMAP 496
Device 1 Serial Number: Unknown

2.1. 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 250 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 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.¹

2.2. Garmin GPSMAP 496 Data Recovery

The device was severely damaged by impact and water immersion during the accident sequence. Upon recovery, the device was resubmerged and shipped to the Vehicle Recorder Laboratory where it was cleaned, rinsed, and dried in a controlled environment. Figures 1 and 2 show the condition of the device upon receipt in the laboratory. Due to the impact damage, the device would not power up and the memory chip was removed and imaged to retrieve the data.



Figure 1. Front of device, as received.



Figure 2. Rear of device, as received.

¹ Semiconductor memory that does not require power to retain data

2.3. Garmin GPSMAP 496 Data Description

The data extracted included 65 sessions from February 2, 2018, through December 20, 2018.² The accident flight was the last session, recorded starting at 12:55:49 UTC and ending at 14:03:50 UTC on December 20, 2018 (223 total data points). The aircraft departed Kissimmee Gateway Airport at about 08:21 EST (13:21 UTC) and headed northbound. The aircraft climbed to about 20,000 feet GPS altitude at 08:50 EST (13:50 UTC). The aircraft began climbing to about 23,000 feet GPS altitude at 08:54 EST (13:54 UTC). At 9:02 EST, the aircraft began turning to the right, descending, and accelerating. The last data point was recorded at 9:03:50 EST at a GPS altitude of 9878 ft and a ground speed of 32 knots. Figure 5 shows an overlay of GPS data for the entire accident flight. The overlay does not necessarily depict the weather or visibility conditions that existed on the day of the accident. Figure 6 shows an overlay of the GPS data at the end of the flight. Figure 7 contains a plot of data from the GPS for the entire accident flight and Figure 8 contains GPS data from the end of the accident flight.

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

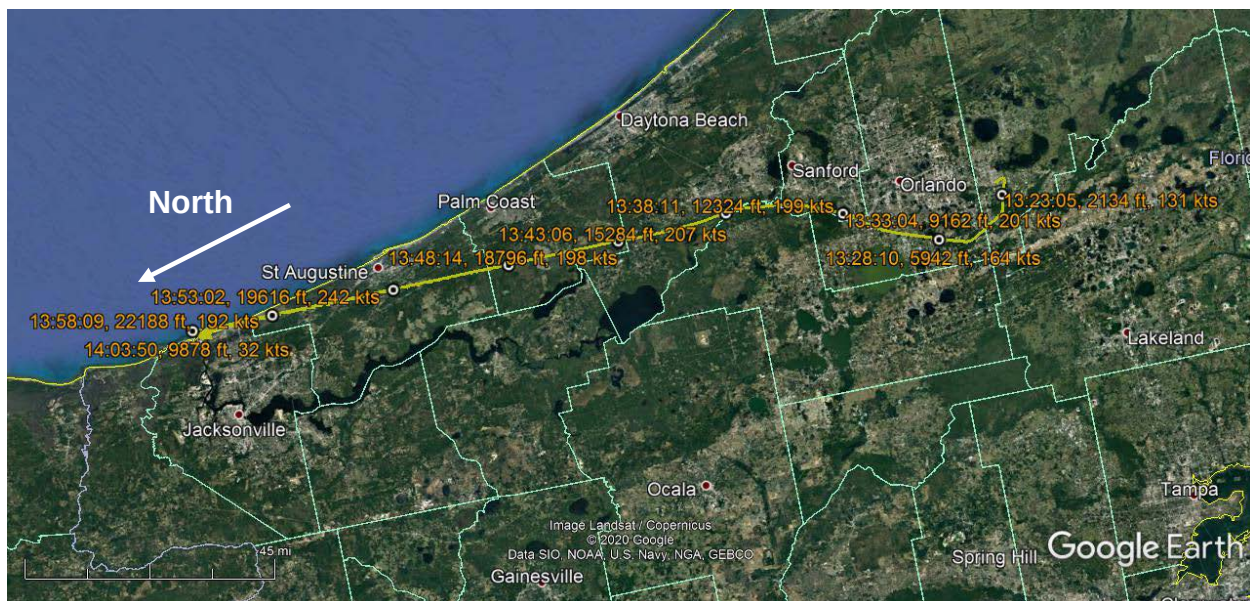


Figure 3. Overlay of GPS data for entire accident flight (Times UTC).



Figure 4. Overlay of GPS data at end of accident flight (Times UTC).

Piper PA-46-350P, N307JM

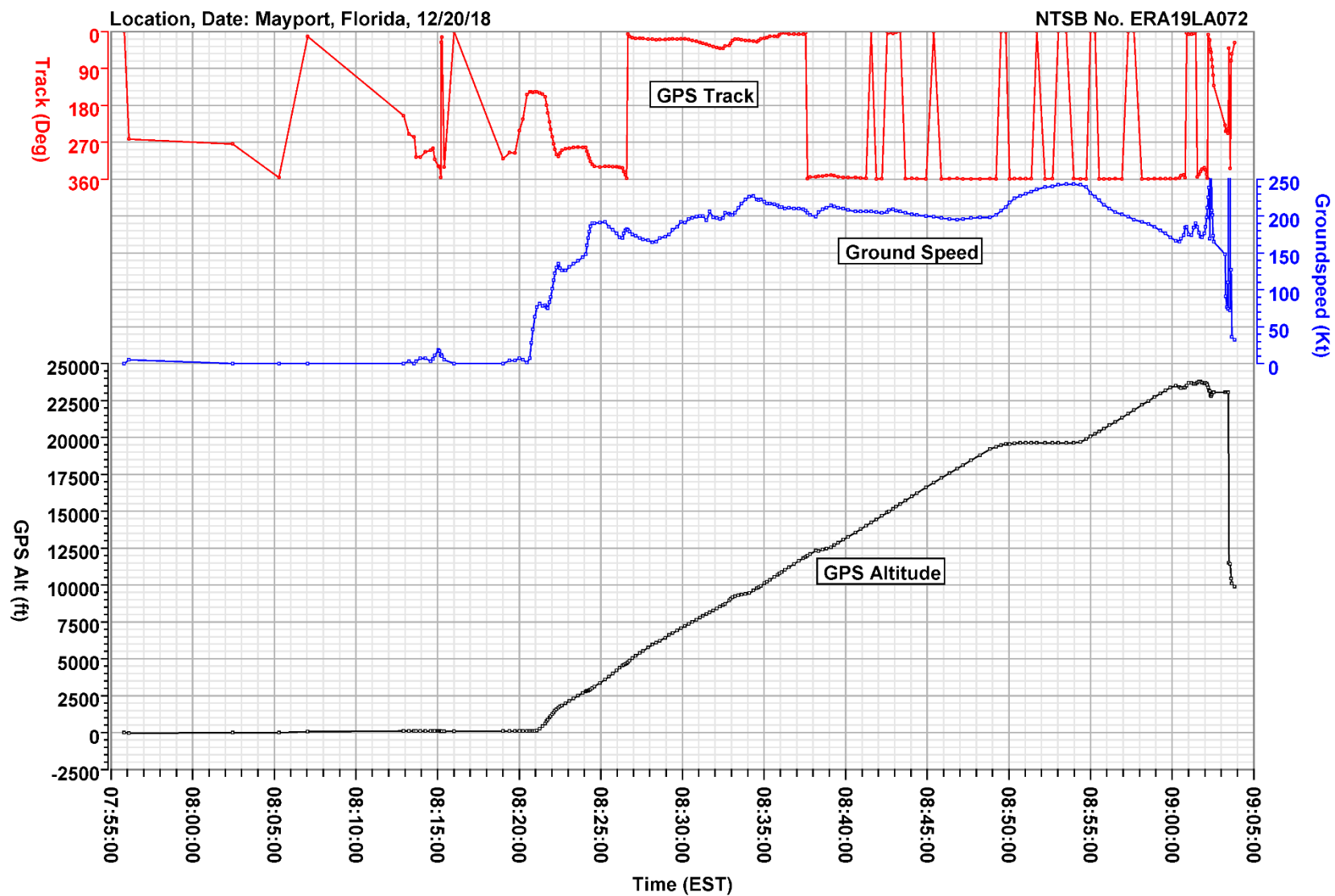


Figure 5. GPS data plotted for entire accident flight.

Piper PA-46-350P, N307JM

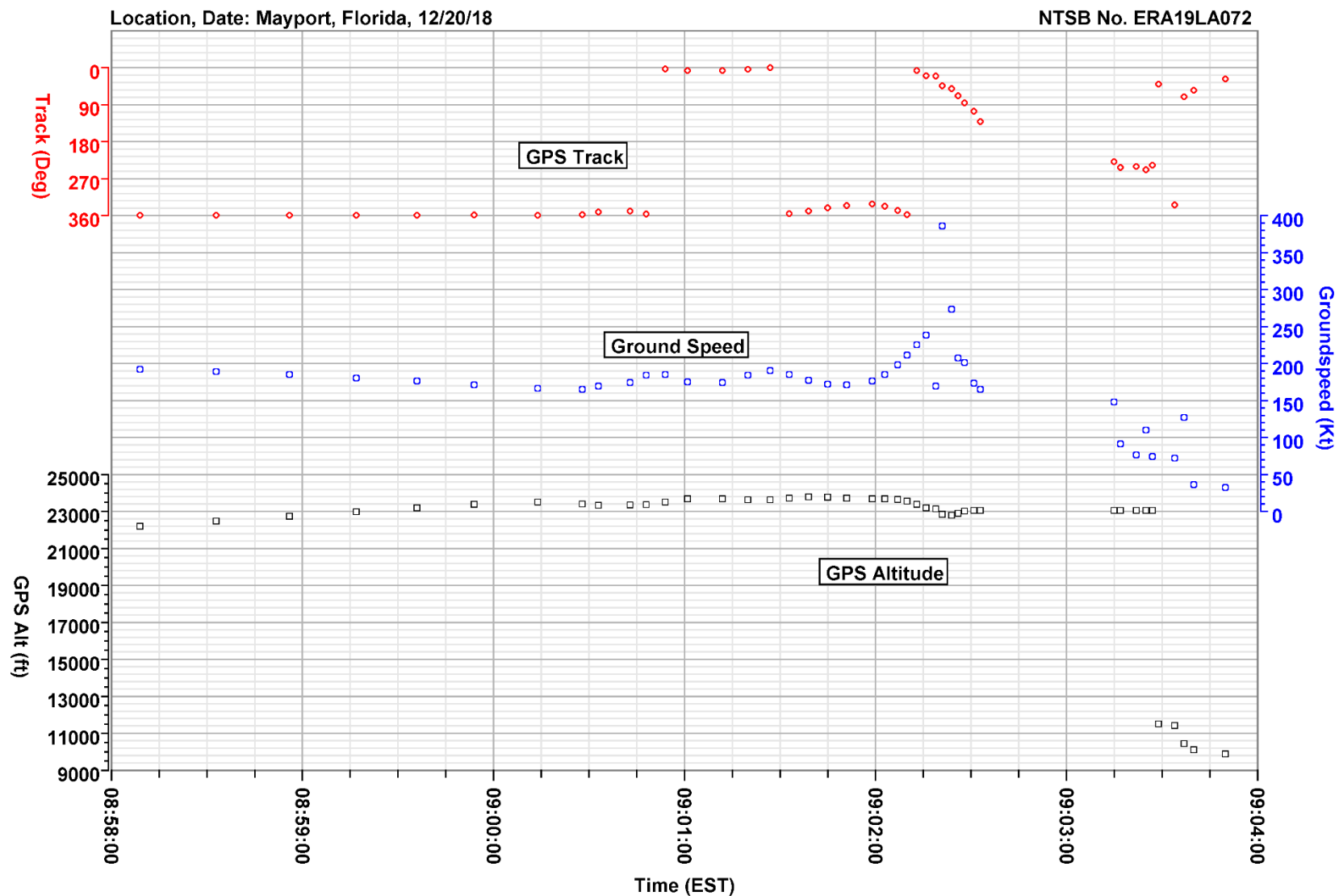


Figure 6. GPS data plotted at end of accident flight.