

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

October 29, 2020

Electronic Devices

Specialist's Factual Report
by Nick Swann

1. EVENT

Location: Ocala, FL
Date: October 31, 2019
Aircraft: Beechcraft BE-58
Registration: N959CM
Operator: Private
NTSB Number: ERA20FA022

On October 31, 2019, at 1130 eastern daylight time (EDT), a Beechcraft BE-58, N959CM, was destroyed after it impacted a vehicle and terrain shortly after takeoff from Ocala International Airport-Jim Taylor Field (OCF), Ocala, Florida. The private pilot and a passenger were fatally injured; one occupant in the vehicle was seriously injured. The airplane was owned and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 post-maintenance test flight. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight that departed OCF at 1128.

2. DETAILS OF INVESTIGATION

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

Device 1: Appareo Stratus 2S
Device 1 Serial Number: 232639
Device 2: Garmin GPSMAP 396
Device 2 Serial Number: unknown

2.1. Appareo Stratus Device Description

The Appareo Stratus 2S is a battery-operated ADS-B receiver with Global Positioning System (GPS) capability designed to interface with an iPad, iPhone, or iPod Touch running the ForeFlight Mobile application via Wi-Fi. The Stratus uses ADS-B to provide access to NEXRAD radar, METARs, TAFs, NOTAMs, and other FAA products via the ForeFlight application installed on a mobile device. ADS-B NEXRAD weather data can be delayed as much as 15 to 20 minutes.

2.1.1. Appareo Stratus Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the unit had sustained significant fire damage as shown in figure 1.



Figure 1. Exterior Damage to Appareo Stratus 2S.

2.1.2. Appareo Stratus Data Description

The data extracted included 28 sessions (272,968 total data points) from September 18, 2019, through October 30, 2019.¹ The accident flight, occurring on October 31, 2019, was not recorded on the device. As such, there was no accident pertinent data stored on this device.

2.2. Garmin GPSMAP 396 Device Description

The Garmin GPSMAP 396 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 NEXTRAD 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 – 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. The current tracklog can be

¹ All dates and times are referenced to Coordinated Universal Time (UTC).

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 memory² (NVM). 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.

2.2.1. Garmin GPSMAP 396 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had sustained significant fire damage as shown in figure 2.



Figure 2. Exterior Damage to Garmin GPSMAP 396.

2.2.2. Garmin GPSMAP 396 Data Description

The data extracted included 89 sessions from May 6, 2019, through October 31, 2019 (15,398 total data points). The accident flight was the 89th session, recorded starting at 15:21:56 UTC and ending at 15:31:07 UTC on October 31, 2019 (48 total data points).

3.1 Plots and Tabular Data

Figure 3 shows a Google Earth overlay of the accident flight. The track shows the airplane departing to the south from OCF and making a left turn eastward. The track then shows an approximately 180 degree turn to the left before the end of the recording. Lighting and weather conditions shown in the Google Earth overlay are not representative conditions at the time of the accident. Validated data parameters used in the following figure are included in attachment 1 on the docket.

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

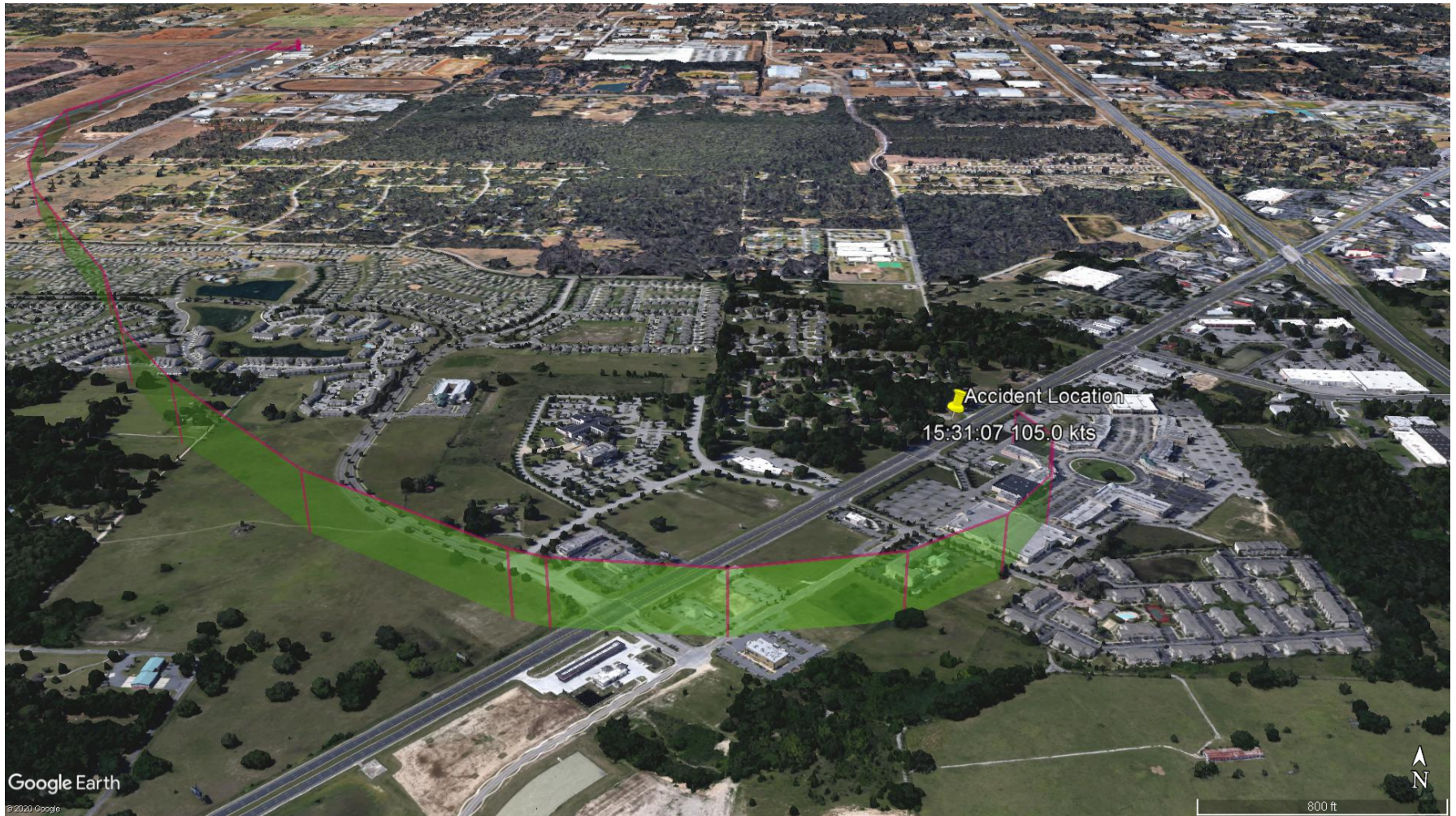


Figure 3. Google Earth Overlay of Accident Flight.