

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

September 25, 2019

Electronic Devices

Specialist's Factual Report

by Gerald Kawamoto

1. EVENT SUMMARY

Location: Broomfield, Colorado
Date: November 2, 2018
Aircraft: MUSTANG II
Registration: N287BM
Operator: Private
NTSB Number: CEN19FA022

On November 2, 2018, about 1153 mountain daylight time (MDT), an amateur-built MUSTANG II airplane, N287BM, impacted terrain while on final approach to the Erie Municipal Airport (EIK), near Broomfield, Colorado. The private pilot and passenger were fatally injured. The airplane sustained substantial damage. The personal flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed and no Federal Aviation Administration (FAA) flight plan had been filed for the flight. The airplane departed EIK at an unknown time for a local flight.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

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

Device 1: Samsung Galaxy Grand Prime SM-G530T
Device 1 Serial Number: R28GC1G6FXM
Device 2: Garmin GPSMAP 496
Device 2 Serial Number: 19711714

3.1. Samsung Galaxy Grand Prime Device Description

Personal Electronic Devices (PEDs) are a category of devices comprised primarily of portable computing devices and mobile phones. Portable computing devices are typically capable of internet access, email, messaging services, and can run user-installed applications to perform specific tasks. Depending on the model, mobile phones can

perform many of the same tasks as portable computing devices, plus have voice call and text messaging capabilities. PED user and system data is typically stored on non-volatile memory (NVM)¹ and can be accessed through manufacturer-provided interfaces.

3.1.1. Samsung Galaxy Grand Prime Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the unit had sustained impact damage, as shown in Figure 1. The device was unable to power on normally and the main board was removed and installed in a surrogate device. The device's content was reviewed and it was determined that there were no data pertinent to the accident investigation.

Figure 1. Photo of damaged Samsung Galaxy Prime as received.



3.2. Garmin GPSMAP 496 Device Description

The Garmin GPSMAP 496 is a battery-powered portable 12-channel GPS receiver with a 256-color thin-film transistor (TFT) liquid-crystal display (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. A built-in AOPA Airport Directory and SafeTaxi Airport Diagrams are included for selected fields. 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. The current tracklog can be 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 memory. The unit contains hardware and software permitting the download of

¹ Non-volatile memory is semiconductor memory that does not require external power for data retention.

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.

3.2.1. Garmin GPSMAP 496 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit has sustained impact damage, as shown in Figure 2. The device did not power on normally. The non-volatile memory chip was removed and data were downloaded and converted to engineering units using laboratory equipment.

Figure 2. Photo of damaged Garmin GPSMAP 496 as received.



3.2.2. Garmin GPSMAP 496 Data Description

One tracklog recorded on November 2, 2018, Coordinated Universal Time (UTC) was extracted. The tracklog recorded was determined to pertain to the accident event and started at 16:55:20 UTC and ended at 17:49:47 UTC. The difference between UTC and MDT is 6 hours.

3.2.3. Garmin GPSMAP 496 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.

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)

3.3. Overlays and Tabular Data

Figure 3 is a graphical overlay generated using Google Earth for the entire 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.

Figure 4 is a graphical overlay generated using Google Earth at the end of the accident flight.

Tabular data used to generate figures 3 and 4 are included as attachment 1 to this report in electronic comma-delimited (.CSV) format.

Figure 3. Google Earth overlay of the entire accident flight.

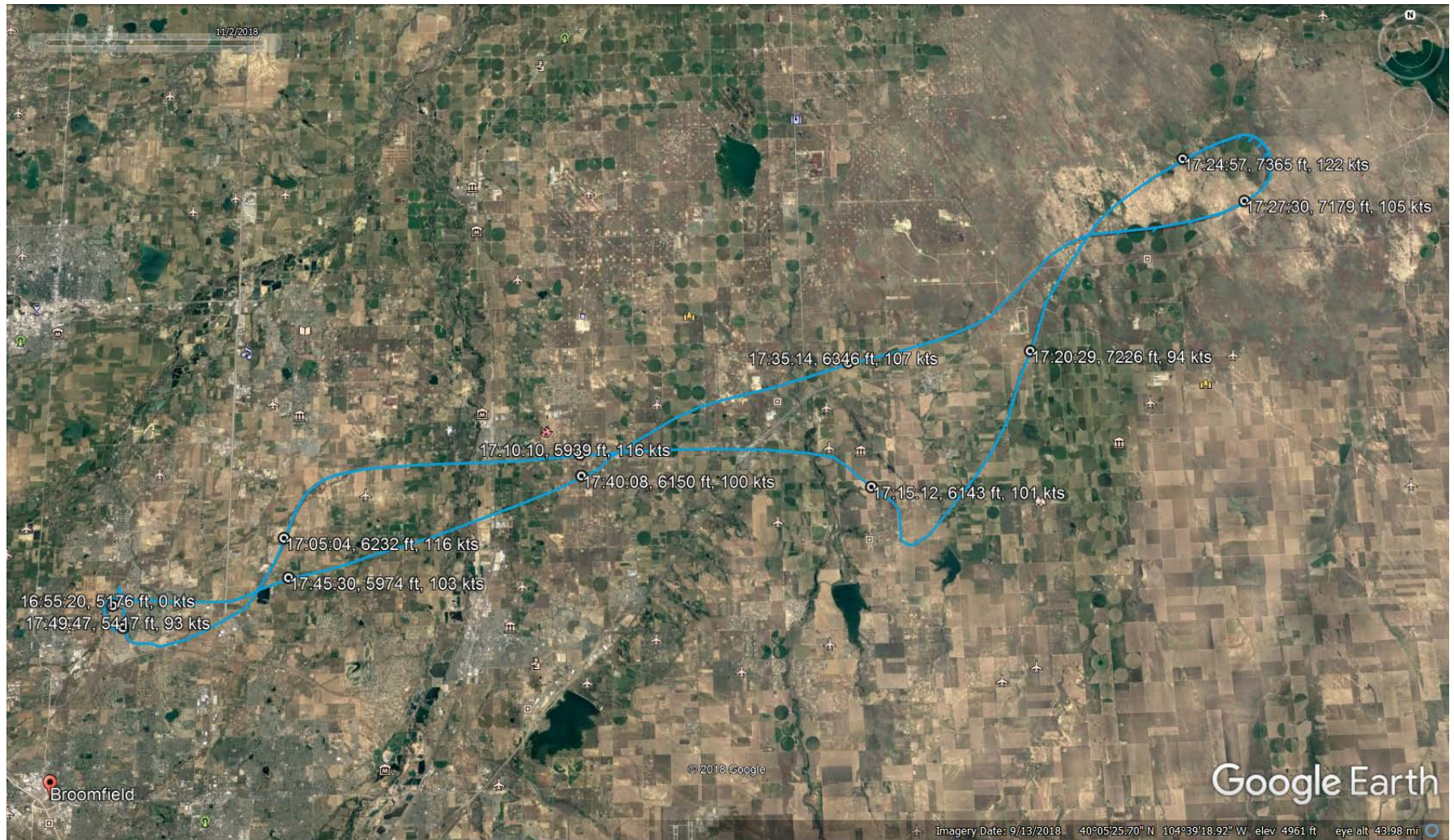


Figure 4. Google Earth overlay at the end of the accident flight.

