

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

October 23, 2015

Multiple Electronic Devices

**Specialist's Factual Report
by George Haralampopoulos**

1. EVENT

Location: Advance, Indiana
Date: April 3, 2015
Aircraft: Aerostar Yak-52TW
Registration: N555GD
Operator: Private
NTSB Number: CEN15FA194

On April 3, 2015, about 1540 eastern daylight time, a S C Aerostar S A Yak-52TW single-engine airplane, N555GD, was destroyed after impacting terrain while maneuvering near Advance, Indiana. The private pilot, who was the sole occupant, sustained fatal injuries. The airplane was registered to and operated by the pilot. Visual meteorological conditions prevailed at the time of the accident and a flight plan was not filed for the 14 *Code of Federal Regulations* Part 91 personal flight. The local flight departed from the Eagle Creek Airpark (EYE), Indianapolis, Indiana, at 1509.

2. DETAILS OF INVESTIGATION

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

Device 1: Unidentified Garmin GPSMAP
Device 1 Serial Number: 19707326

Device 2: Dynon Electronic Flight Instrument System (EFIS) D10A
Device 2 Serial Number: 003362

Device 4: Apple iPhone 6+
Device 4 Serial Number: Unknown

2.1. Personal Electronic Device Data Recovery

The iPhone 6+ (figure 1) is capable of storing data in the non-volatile memory (NVM)¹. The extent of the damage sustained by the iPhone precluded normal recovery

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

procedures and additional attempts using surrogate units were unsuccessful in yielding data. Therefore, no data pertinent data were recovered.



Figure 1. Apple iPhone 6+ as received

2.2. Dynon D-10A EFIS Data Recovery

The Dynon D-10A (figure 2) is capable of storing data in the NVM. An external examination determined the device received severe impact. The housing was removed and the internal memory chip containing the devices NVM was located and read out using laboratory equipment. A thorough analysis of the imaged data showed that no data was recorded to the device and no further work was performed.



Figure 2. Dynon D-10A as received

2.3. Garmin GPSMAP Device Description

The Garmin GPSMAP 496 is a battery-powered portable 12-channel GPS receiver with a 256-color TFT LCD display screen.

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 for an unspecified number of points – 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 nvm.

2.3.1. Garmin GPSMAP Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the unit had sustained significant damage (figure 3). The circuit board containing the unit's nvm was located and the memory chip was removed and read out using laboratory equipment. The data was successfully recovered using forensic software.



Figure 3. Garmin GPSMAP as received

The accident flight was not identified in the 65 recorded sessions from June 1, 2014² through March 22, 2015. Ten flights were recorded in the calendar year. No additional pertinent information could be extracted from the device.

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