

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

March 7, 2017

Electronic Devices

**Specialist's Factual Report
by James Cash**

1. EVENT

Location: Fairview, Oklahoma
Date: July 21, 2016
Aircraft: Skybolt 300
Registration: N511GS
Operator: Private
NTSB Number: CEN16FA278

On July 21, 2016, about 1840 central daylight time, a Runyan/Harris Skybolt 300 experimental amateur-built airplane, N511GS, was substantially damaged when it impacted terrain northeast of Fairmont, Oklahoma. The commercial pilot and pilot-rated passenger were fatally injured. The airplane was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which operated without a flight plan. The flight originated from Enid Woodrig Regional Airport (WDG), Enid, Oklahoma, about 1830.

2. DETAILS OF INVESTIGATION

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

Device 1: Garmin VIRB XE
Device 1 Serial Number: 469001548

Device 2: Garmin VIRB XE
Device 2 Serial Number: 3AN041964

Device 3: Electronics International UBG-16
Device 3 Serial Number: 062553

Device 4: JPI FS-450
Device 4 Serial Number: 02179

2.1. Garmin VIRB and VIRB XE Device Description

The Garmin VIRB and the VIRB XE video recorders are high definition self-contained battery powered video and audio recorders. The units are capable of recording high definition imagery along with stereo audio information on an internal micro SD memory card. The unit is mounted in a waterproof plastic case that permits the operation of the recorder to water depths of over 100 feet. There are some slight differences between the VIRB and the VIRB XE in the overall resolution of the video and in the capabilities of the wireless interface, but generally the units are identical in function and operation.

2.1.1. Garmin VIRB XE Data Recovery (device 1)

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the unit had not sustained any damage and the information was extracted by removing the internal micro SD card and playing the recorded video files. No video files were found that correspond to the accident flight. To further investigate the lack of accident imagery, forensic software was used to examine the internal micro SD card. No additional imagery was found.

2.1.2. Garmin VIRB Data Recovery (device 2)

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the unit had not sustained any damage and the information was extracted by removing the internal micro SD card and playing the recorded video files. No video files were found that correspond to the accident flight. To further investigate the lack of accident imagery, forensic software was used to examine the internal micro SD card. No additional imagery was found.

2.2. Electronics International UBG-16 Device Description (device 3)

The Electronics International UBG-16 device is a panel mounted gauge that the operator can monitor up to 24 parameters related to engine operations. Depending on the installation, engine parameters monitored can include: Exhaust Gas Temperature (EGT), Cylinder Head Temperature (CHT), Oil Pressure and Temperature, Manifold Pressure, Outside Air Temperature, Turbine inlet Temperature, Engine Revolutions per Minute, Fuel Flow, and Battery Voltage. The unit can also calculate, in real-time, shock cooling rate and EGT differentials between the highest and lowest cylinder temperatures. The unit does not contain any non-volatile memory so no data was obtained that pertained to the accident flight.

2.3 JPI FS-450 Device Description (device 4)

The JPI FS-450 fuel flow meter is a self-contained fuel flow/fuel used device. At the beginning of the flight, the pilot manually enters the total amount of fuel onboard the aircraft. The unit senses the amount of fuel used and provides a display of the total fuel remaining and the current fuel usage rate. The unit does contain a small amount of non-volatile memory that allows it to retain the amount of fuel remaining (fuel used) since the last time the pilot reset the total fuel onboard the aircraft.

2.3.1 JPI FS-450 Data Description (device 4)

The JPI FS-450 fuel flow meter was substantially damaged during the accident. The unit was not able to be repaired. The non-volatile memory chip was removed from the device and the recorded data was extracted using the laboratory's memory reader. The recorded fuel remaining amount was extracted and decoded using information provided by JPI. The last value of the fuel remaining was decoded as 27 gallons.