

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

November 20, 2015

Electronic Device

Specialist's Factual Report

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1. EVENT SUMMARY

Location: Amery, Wisconsin
Date: July 27, 2015
Aircraft: Hawker Beechcraft M35
Registration: N9CB
Operator: Private
NTSB Number: CEN15FA320

On July 27, 2015, about 1724 central daylight time, a Beech M35 airplane, N9CB, was destroyed after impacting terrain near Amery, Wisconsin. The pilot and three passengers were fatally injured. The airplane was registered to and operated by St. Croix Bonanza Association, LLC., under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a personal flight. Day visual meteorological conditions prevailed for the flight, with no flight plan filed. The flight departed from New Richmond Regional Airport (RNH), New Richmond, Wisconsin, about 1716 and was destined for Voyager Village Airstrip (9WN2), Webster, Wisconsin.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

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

Device Manufacturer/Model:	Appareo Stratus 2
Serial Number:	Unknown

3.1. Device Description

The Appareo Stratus 2 is a battery operated ADS-B¹ receiver with GPS capability designed to interface with an iPad running ForeFlight² via WiFi³. The Stratus uses ADS-B to provide access to NEXRAD radar, METARs, TAFs, NOTAMs and other FAA products via the ForeFlight App installed on a mobile device. The Stratus supports limited reception and display of ADS-B traffic information. Certain models include a complete Attitude Heading Reference System (AHRS) that permits supplemental attitude information on the connected mobile device.

Stratus PRX V2 units with firmware version 1.6 and later have the ability to record up to 20 hours of flight data at a rate of 5 samples per second. The records consist of the following parameters:

- GPS 3-D position
- Altitude
- Groundspeed
- AHRS Pitch, Roll and Yaw
- AHRS 3-D accelerations
- Heading
- Ground Track

3.2. Data Recovery

The device arrived to the laboratory exhibiting heavy fire and impact damage. Figure 1 shows the front of the device. Figure 2 shows the back of the device.



Figure 1. Photo of the front of the Appareo Stratus device.

¹ Automatic Dependent Surveillance - Broadcast; a supplement to the traditional radar-based aircraft surveillance system that uses aircraft transponder emissions to inform nearby aircraft of traffic location and movement. The system also supports the passing of weather information.

² ForeFlight – An mobile based application used for assistance with aeronautical navigation.

³ WiFi – A local area wireless network.



Figure 2. Photo of the back of the Appareo Stratus device.

The melted portions of the device were cut and removed to gain access to the internal circuit boards. Two circuit boards were removed (figure 3). The non-volatile memory (NVM) chip was identified and removed (figure 4). The NVM chip was connected to the appropriate style socket and its memory accessed via a PC. A review of the binary data showed the memory chip contained only “FF”⁴.

As noted in the device description, in order for an Appareo Stratus 2 to contain data, the user must have updated the device’s firmware to version 1.6 or later. It could not be confirmed if this particular device contained firmware version 1.6 or later.



Figure 3. Photo of the circuit boards after removal.

⁴ FF block – The last character descriptor in an ASCII table. Often times uses to denote an empty or unused block.



Figure 4. Photo of NVM chip after removal from circuit board.

3.3. Data Description

The device's NVM chip was found to contain only FF blocks throughout. It was determined that the device did not store any flight data.