

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

May 11, 2018

Electronic Devices

Specialist's Factual Report By Ben Hsu

1. EVENT

Location: Alexandria, Minnesota
Date: September 17, 2016
Aircraft/ID: Agusta A109 / N91NM
Operator: North Memorial Medical Center
NTSB Number: CEN16FA372

2. EVENT SUMMARY

On September 17, 2016, at 0207 central daylight time, an Agusta S.p.A A109S helicopter, N91NM, impacted trees and terrain near Chandler Field Airport (AXN), Alexandria, Minnesota. The commercial rated pilot and two crew members sustained serious injuries and the helicopter was destroyed. The helicopter was registered to North Memorial Health Care, Brooklyn Center, Minnesota, and operated by North Memorial Medical Center under the provisions of 14 *Code of Federal Regulations* (CFR) Part 135 as a positioning flight. Night instrument meteorological conditions prevailed at the accident site and an instrument flight rules (IFR) flight plan had been filed. The helicopter departed Brainerd Lakes Regional Airport (BRD), Brainerd, Minnesota about 0135 central daylight time and was destined for the Douglas County Hospital helipad, Alexandria, Minnesota.

3. DETAILS OF DEVICE INVESTIGATION

The NTSB's Vehicle Recorder Division received the following devices:

Device:	Appareo Stratus 2S
Device Serial Number:	014683
Device:	Garmin GNS 530
Device Serial Number:	78414503
Device:	Garmin GNS 530 Memory Card
Device Serial Number:	Unknown
Device:	Garmin GNS 530 Memory Card
Device Serial Number:	Unknown
Device:	Garmin GNS 430 Memory Card
Device Serial Number:	Unknown

Device: Sandel ST3400
Device Serial Number: 46-1020

Figure 1 shows the Appareo Stratus 2S device as it arrived in the laboratory.

Figure 2 shows the Garmin GNS 530 device as it arrived in the laboratory.

Figure 4 shows the two Garmin GNS 530 memory cards and the Garmin GNS 430 memory card as they arrived in the laboratory. These memory cards contain aviation and terrain databases but do not contain any user-generated data.

Figure 5 shows the Sandel ST3400 device as it arrived in the laboratory.

3.1. Appareo Stratus 2S Detailed 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.

Data downloaded from the device covered the period from September 16, 2016 15:08:21 CDT to September 16, 2016 20:11:31 CDT. No data from the accident flight was recorded.

3.2. Garmin GNS 530 Detailed Description

The Garmin Model GNS 530W is a panel-mounted GPS receiver featuring a 5-inch color liquid crystal (LCD) display and offering navigation and communication data, along with precision and non-precision approach certification in the IFR environment. The unit has a slot for a Jeppesen database (front-loading data card) containing all airports, VORs, NDBs, intersections, Approach, STAR/SIDs and SUA information.

Power was applied to the device using a benchtop docking station. The device's COM frequency was set to 123.000 MHz and the VLOC frequency was set to 109.70 MHz. When the device is powered using the docking station, the GPS is automatically put into a "simulator" mode. Therefore, the map location shown on the screen is not indicative of any accident information. Figure 3 shows the Basemap Land Database version as 4.00 and the Aviation Database expiration date as October 13, 2016.

3.3. Sandel ST3400 Detailed Description

The Sandel ST3400 is an integrated Terrain Awareness and Warning System (TAWS). The device is capable of recording GPS coordinates, track, barometric altitude, vertical velocity, and radar altitude. Time is recorded as seconds elapsed since power on.

Figure 6 shows the full GPS track as recorded by the device. Figure 7 shows the end of the dataset recorded by the device. The dataset begins at Brainerd Lakes Regional Airport (BRD) and ends at Alexandria Municipal Airport (AXN).

Attachment 1 includes additional recorded parameters in comma-separated variable (CSV) format.

Figure 1. Appareo Stratus 2S



Figure 2. Garmin GNS 530



Figure 3. Garmin GNS 530

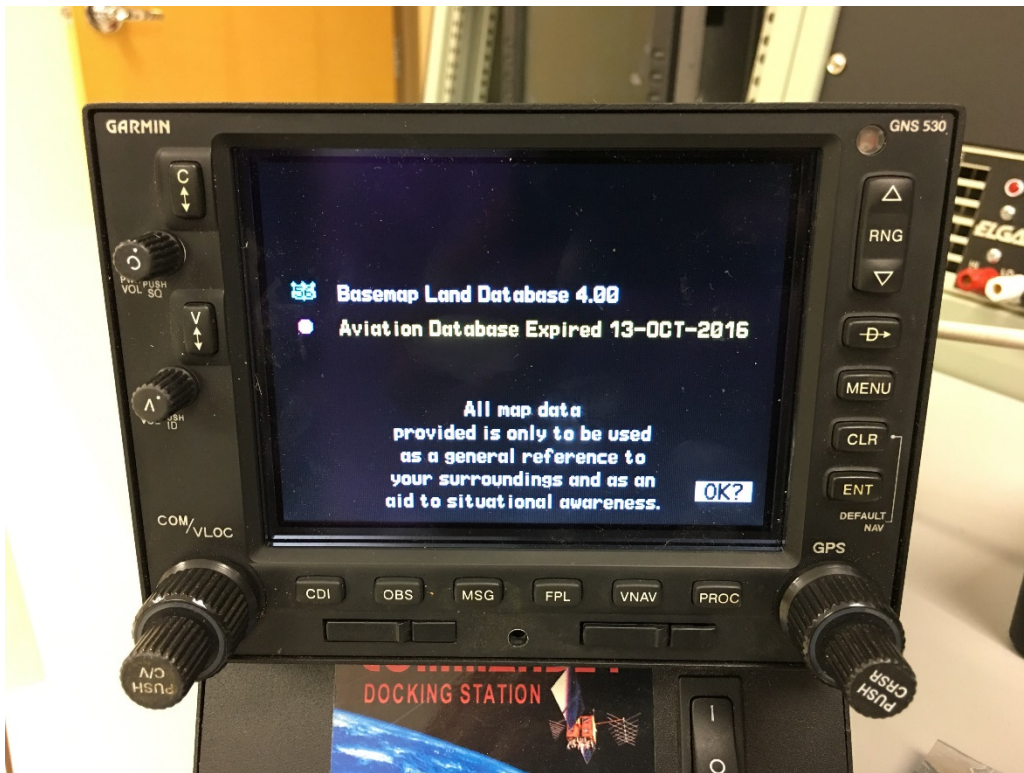


Figure 4. Garmin GNS 530 and 430 memory cards



Figure 5. Sandel ST3400



Figure 6. Full GPS track recorded by the Sandel ST3400

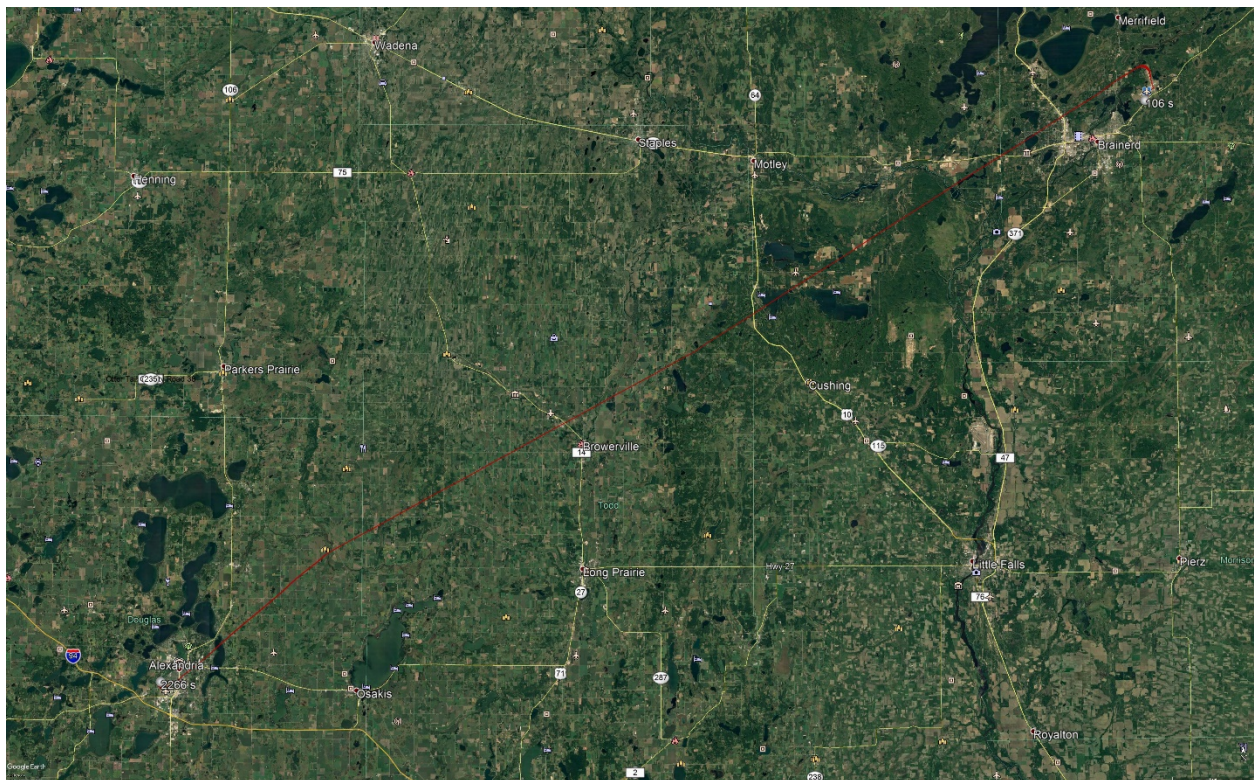


Figure 7. End of the dataset recorded by the Sandel ST3400

