

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

August 6, 2015

Global Positioning System Device

Specialist's Factual Report

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1. EVENT SUMMARY

Location: Macedonia, Iowa
Date: September 6, 2014
Aircraft: Robinson R44
Registration: N699TQ
Operator: Johnson Helicopter Services
NTSB Number: CEN14LA487

On September 6, 2014, about 1245 central daylight time, a Robinson R44 II helicopter, N699TQ, impacted a suspended power line near Macedonia, Iowa. The pilot was fatally injured and the helicopter was substantially damaged. The helicopter was registered to Mills County Choppers, Inc., and operated by Johnson Helicopter Services under the provisions of 14 Code of Federal Regulations Part 137 as an aerial application flight. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed. The local flight originated at an unknown time.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following global positioning system (GPS) device:

Device Manufacturer/Model:	DynaNav DynaFlight AirAg-E
Serial Number:	E2063

3.1. Device Description

The DynaFlight-Air Ag-E is manufactured by DynaNav and is a global positioning system based guidance and mapping system that aids in the application of seeds, fertilizers and chemicals to a treatment area. Data is stored in a compact flash drive inside the device and can be transferred by the USB port. The data is sampled at 10

times per second but not stored at that rate. The storage rate is determined by an algorithm based on the dynamics of the aircraft.

3.2. Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed that the unit had sustained moderate damage. The device was covered with a coating of an unknown brown powdered substance. The glass protecting the screen on the front was broken. Figures 1 and 2 show the front and back of the device as received at the Vehicle Recorder Laboratory.



Figure 1 : Front of DynaFlight AirAg-E



Figure 2 : Back of DynaFlight AirAg-E

The screen did not function. The unit was connected to a laboratory computer for readout but was not able to be detected by the readout station. The device was opened and was inspected for any additional damage.

Visible damage was found and no obvious repairs could be made. The compact flash card was identified. The card was found to be in good condition after removal. The card read out normally and the data was extracted. The read out resulted in a file which was converted to a Google Earth file using manufacturer's software.

3.3. Data Description

The data extracted included 23 sessions from June 7, 2013,¹ through September 6, 2014. The accident flight was recorded starting 17:03:12 UTC and ending 17:07:19 UTC on September 6, 2014.

3.4. Parameters Provided

Table 1 describes data parameters provided by the GPS device. Date, Time, Latitude, Longitude, and GPS Altitude are recorded by the device.

¹ All dates and times are referenced to Coordinated Universal Time (UTC)

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)

3.5. OVERLAYS AND TABULAR DATA

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

The data shows the flight moving northeast at the beginning of the flight, then moving further to the west as the last data point was captured. During the flight, crops were sprayed in the red zones as shown in Figure 3. The flight path is shown in yellow. Due to data buffering on the GPS unit, the data recording may have ended before the accident event.

Tabular data used to generate figure 3 are included as Attachment 1. This attachment is provided in electronic comma-delimited (.CSV) format.



Figure 3 : Graphical overlay generated using Google Earth of the flight path