

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

January 9, 2018

Global Positioning System Device

Specialist's Factual Report

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1. EVENT SUMMARY

Location: Uganik Lake, Alaska
Date: September 9, 2016
Aircraft: de Havilland DHC-2 (Beaver)
Registration: N91AK
Operator: Island Air
NTSB Number: ANC16LA062

On September 9, 2016, about 1130 Alaska daylight time (AKDT), a float-equipped, de Havilland DHC-2 (Beaver) airplane, N91AK, sustained substantial damage during a collision with water, following a loss of control shortly after takeoff from Uganik Lake, about 35 miles west-southwest of Kodiak, Alaska. The airplane was registered to Redemption, Inc., Kodiak, and operated as Flight 43 by Island Air, Kodiak, as a visual flight rules (VFR) scheduled commuter flight under the provisions of 14 *Code of Federal Regulations* Part 135. Of the three occupants on board, the commercial pilot and two passengers all sustained serious injuries. Visual meteorological conditions prevailed, and company flight following procedures were in effect. Flight 43 originated in Kodiak about 1100, with a preplanned, intermediate stop at Uganik Lake, before continuing to the flights scheduled stops in Amook Bay and Zachar Bay, Alaska.

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: Garmin GPSMAP 495
Serial Number: 1E0004142

3.1. Device Description

The Garmin GPSMAP 495 is a battery-powered portable 12-channel GPS receiver with a 256-color TFT LCD display screen. The unit stores date, route-of-flight, and flight-time information for up to 50 flights. A flight record is triggered when groundspeed exceeds 30 knots and altitude exceeds 500 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 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 the recording stops, depending on how the unit is configured. The current tracklog can be saved to long-term memory and 15 saved tracklogs can be maintained in addition to the current tracklog. Tracklog storage may be activated or de-activated at user discretion. All recorded data is stored in non-volatile memory¹. The unit contains hardware and software permitting the download of recorded waypoint, route, and tracklog information to a PC via a built-in serial port using the NMEA 0183 version 2.0 protocol. The unit can also communicate with external devices such as a computer using a built in USB port. An internal button-battery is used to back-up power to the internal memory and real-time clock during those periods when main power is removed.

3.2. Data Recovery

Upon arrival at the NTSB Vehicle Recorder Division, an exterior examination did not reveal any damage. Power was applied and information was downloaded normally using Garmin's MapSource software.

3.3. Data Description

The data extracted included 45 recording sessions from August 31, 2016,² through September 9, 2016. The leg inbound to the lake, the landing, and the subsequent takeoff are considered in this report.

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. Groundspeed and Track are derived from the recorded parameters.

Table 1. GPS 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)

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

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

Parameter Name	Parameter Description
Longitude	Recorded Longitude (degrees)
GPS Alt	Recorded GPS Altitude (feet)
Groundspeed	Average derived groundspeed (knots)
Track	Average derived true course (degrees)

3.5. OVERLAYS AND TABULAR DATA

Figures 1 through 4 are graphical overlays 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.

Figure 1 shows an overview of the entire recording, originating in Kodiak at 18:42:51 UTC, and landing at Uganik Lake at 19:18 UTC.

Figure 2 shows the landing at Uganik Lake. The aircraft landed at about 19:18:00 UTC, and then about 19:26:00 UTC, began to water taxi away from the shoreline

Figure 3 shows the water taxi and takeoff. Between 19:32:17 UTC and 19:32:48 UTC, the groundspeed began to accelerate as the aircraft track turned left from northwest to west. At 19:32:17 UTC, the aircraft was about 2,980 feet from the shoreline.

Figure 3 additionally shows the aircraft climbed and turned, at groundspeeds just below 50 knots. Between 19:33:15 and 19:33:24 UTC, the aircraft track turned left from west to south.

Figure 4 shows the final recorded points, including a decrease in altitude. The last sequential flight-recorded point was at 19:33:27 UTC; subsequent points starting at 19:38:01 UTC were recorded after the collision with water.

Tabular data used to generate figures 1 through 4 are included as attachment 1. This attachment is provided in electronic comma-delimited (.CSV) format.

Figure 1. Overview of inbound flight, landing, and subsequent accident takeoff.



Figure 2. Detail of inbound landing.



Figure 3. Accident takeoff.



Figure 4. End of accident recording.

