

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

February 4, 2020

Onboard Image Recorder

Specialist's Factual Report
By Gerald Kawamoto

1. EVENT

Location:	Soddy-Daisy, TN
Date:	January 7, 2019
Aircraft:	Bellanca 17-30A, N8849V
Operator:	Private
NTSB Number:	ERA19LA080

2. GROUP

A group was not convened.

3. SUMMARY

On January 7, 2019, about 1334 eastern standard time, a Bellanca 17-30A, N5624S, was substantially damaged when it impacted Lake Chickamaugua, while maneuvering near Soddy-Daisy, Tennessee. The commercial pilot and passenger were fatally injured. The airplane was owned and operated by the commercial pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the local personal flight that originated from Dallas Bay Sky Park (1A0), Chattanooga, Tennessee, about 1330.

4. DETAILS OF INVESTIGATION

On February 11, 2019, the National Transportation Safety Board (NTSB) Vehicle Recorder Division received a memory stick containing video images from two GoPro Hero 3 devices that were mounted to the aircraft:

Recorder Manufacturer/Model:	GoPro Hero 3
Recorder Serial Number:	Video on Memory Stick

4.1. Recorder Description

The GoPro is a compact, lightweight, point-of-view digital camera enclosed in a ruggedized housing that allows the camera to be mounted in a variety of positions using an array of supported accessories. The camera supports various recording resolutions and frame rates set by the user. The camera can be set to record still images

simultaneously or independently of the video stream. The camera supports recording to micro SD¹ cards. A built in WiFi module allows users to connect to the camera via an accessory remote control or a smart phone app that permits camera control and image transfer.

4.2. Recorder Damage

The GoPro devices were recovered from Lake Chickamauga. Photographs taken at the scene of the recovery of the devices showed the devices intact with potential water intrusion. The data was recovered by law enforcement officials and delivered to the NTSB laboratory on a memory stick.

4.3. Video Files

The memory stick received by the lab included a total of six video files pertaining to the accident flight. Two files were recorded from a camera mounted on the right horizontal stabilizer and four files were recorded from a camera mounted on the left horizontal stabilizer. The images from the right horizontal stabilizer contained the entire accident flight. The images from the left horizontal stabilizer contained the accident flight but the video cutoff approximately 20 seconds prior to the accident event. Forensic recovery of additional video images closer to the accident event from the file was attempted but was unsuccessful. All recordings were made at a resolution of 1920 x 1080 pixels at a frame rate of 29.97 frames per second (fps).

4.4. Timing and Correlation

The times used in this report are expressed as Video Elapse Time, which is time from the beginning of the recording. The format given is MM:SS, where MM stands for the number of elapsed minutes and SS the number of elapsed seconds.

4.5. Summary of Recording Contents

In agreement with the Investigator-In-Charge, a video group did not convene and a summary report was prepared.

4.5.1. Video Recording One: Right Horizontal Stabilizer

Figure 1 is a digital illustration of the camera's field of view. The GoPro was mounted on the right horizontal stabilizer looking forward. It captured the right flap and right aileron positions as well as an indication of whether the engine was running. No audio track was included with the video file.

¹ Secure Digital – a standardized format for removable memory devices.



Figure 1. A digital illustration of the field of view of the camera on the right horizontal stabilizer.

Right Horizontal Stabilizer File 1:

The video began as the airplane was stationary with its engine off and positioned near a hangar. The door on the right side of the aircraft was open and the right flap was in an up position. At 00:38 the operator came into the field of view of the camera from the right side of the image and approached the area of the camera and right horizontal stabilizer. The operator paused, exited the field of view until returning at 00:47, at which time they approached the door on the right side and entered the aircraft, appearing to climb over a passenger sitting in the right seat.

At 04:18 the engine started and at 04:47 the door closed by an arm consistent with that of the passenger.

At 06:34 the aircraft began to taxi. The aircraft continued to taxi until coming to the run-up area near the runway at 09:23. The right aileron moved consistent with a flight control check and the visible propeller RPM changed consistent with an engine run-up.

At 12:03 the aircraft began to move forward again and at 12:34 reached the runway. At 13:04 the aircraft began to accelerate forward and at 13:23 the wheels left the ground. The aircraft continued to climb and at 13:48 the right flap was observed moving back to a neutral position.

The first video file from this camera ended at 17:35 and a new file began, consistent with the recording logic of a GoPro camera.

Right Horizontal Stabilizer File 2:

The next video began where the first video ended, and all times for the second recording are given as elapsed time from the start of the first recording.

At 17:50 the aircraft began flying over a body of water. During the portion of the flight over water the aircraft descended while flying wings level.

The shadow of the aircraft was observed on the water and continued to increase in size in the image as the aircraft descended and got closer to the water. At 19:11 the aircraft appeared to reach the lowest point of its descent and maintained its current level for the next 22 seconds.

At 19:33 the aircraft began to pitch up and at 19:35 the shadow of the aircraft was no longer in the field of view of the camera. During the time interval in which the shadow was observed, there were no indications that any parts separated from the aircraft.

The aircraft continued to pitch up beyond 30 degrees above the horizon. At 19:38 the aircraft began rolling left as it was pitched up and continued to roll left while pitched up.

At 19:44 the aircraft had rolled approximately 90 degrees left and the aircraft's nose had begun to fall through the horizon (becoming negative in pitch). During this time the right aileron is observed in an upward position (right roll command). At this time the aircraft appeared to depart controlled flight. The aircraft continued to roll left sharply and appeared to enter a left spin. The aircraft completed approximately one full rotation of a left spin and impacted the water at 19:50. During the time in which the aircraft was descending in a left spin, the right aileron was observed in mostly an upward position. During the pitch up and subsequent departure from controlled flight, the flaps were observed in the up position and the propeller continued to rotate and did not appear to lose RPM.

Between 19:50 and 20:31, water filled the camera's image and it became completely blacked out at 20:32. The recording continues until 29:25. No further video events were transcribed.

4.5.2. Video Recording Two: Left Horizontal Stabilizer

Figure 2 is a digital illustration of the camera's field of view. The GoPro was mounted on the left horizontal stabilizer looking forward. It captured the left flap and left aileron positions as well as an indication of whether the engine was running. An audio track was included with the video files.

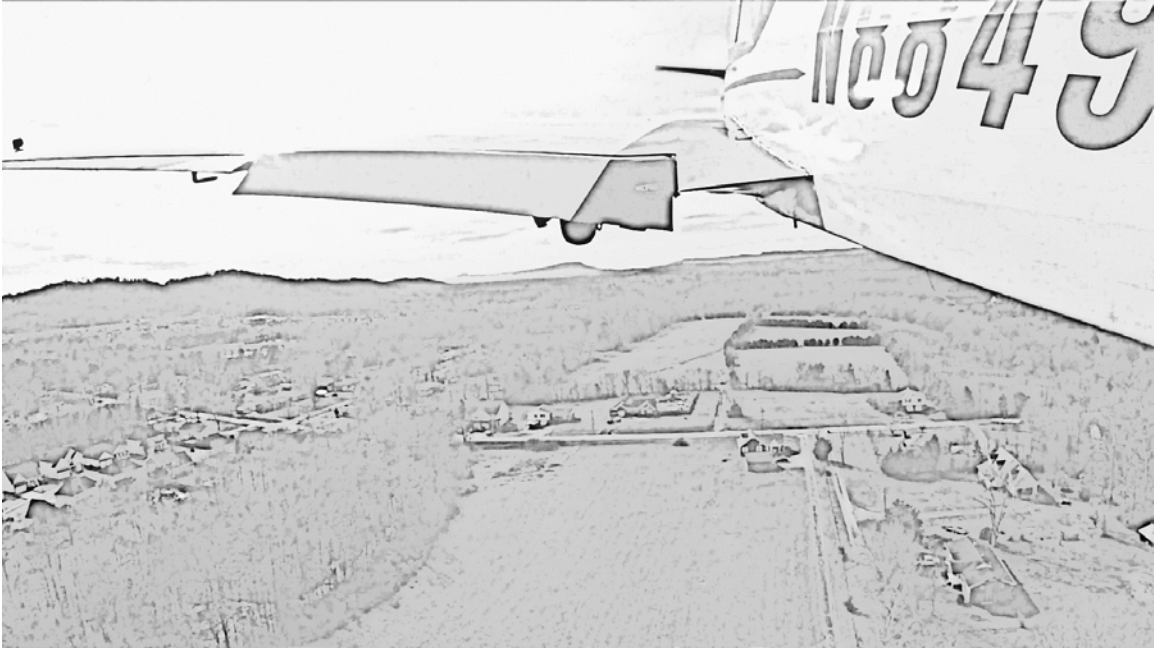


Figure 2. A digital illustration of the field of view of the camera on the left horizontal stabilizer.

The video and audio files were mostly unremarkable. The video content contained the same type of information observed in the right horizontal stabilizer files but on the other side of the aircraft.