

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

February 10, 2022

Onboard Image Recorder

Specialist's Factual Report
By Kyle Garner

1. EVENT

Location: Ruidoso, New Mexico
Date: August 17, 2019
Aircraft: Beech H35
Registration: N5410D
Operator: Private
NTSB Number: WPR19LA223

2. ONBOARD IMAGE RECORDER GROUP

An onboard image recorder group was not convened.

3. DETAILS OF INVESTIGATION

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

Recorder Manufacturer/Model: **GoPro HERO7**
Recorder Serial Number: **Unknown**

3.1. GoPro HERO7 Description

The GoPro HERO7 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 device can record a maximum of 4K resolution video at a frame rate of up to 60 frames per second (FPS). The camera supports 1080p HD as well as other lower-quality recording resolutions at higher frame rates.

The camera can be set to record still images simultaneously or independently of a video stream at a resolution of up to 12 megapixels. The camera supports recording to microSD cards up to 256 GB in size. A built-in Wi-Fi module allows users to connect to the camera either via an accessory remote control or via a smartphone app that permits camera control and image transfer.

3.2. GoPro HERO7 Condition

The GoPro HERO7 arrived at the Vehicle Recorder Division laboratory intact, however, the status screen on the front of the device was damaged as shown in Figures 1 and 2.



Figure 1. Condition of GoPro HERO7 – Front



Figure 2. Condition of GoPro HERO7 – Back

An undamaged 32 GB microSD card was found sealed in the card slot. The microSD card was connected to a PC via a forensic write blocker and its filesystem was accessed successfully.

3.3. Video Files

The microSD card from the GoPro HERO7 contained two accident relevant .mp4 files. The first .mp4 file contained audio and video of the accident flight taxi-out to the departure runway 30 at Sierra Blanca Regional Airport, Ruidoso, New Mexico (KSRR). The second .mp4 file contained audio and video of the accident flight takeoff and subsequent impact with terrain. Other video files on the device were deemed not relevant to the accident and are not discussed in this report.

3.4. Timing and Correlation

Timing in this report is expressed as video elapsed time, which is the time from the beginning of each recording.

3.5. Summary of Recording Contents

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

In both videos, the GoPro was handheld by the passenger seated in the right seat next to the pilot flying.

3.5.1. Summary of Video 1 – Accident flight taxi-out to the departure runway

The first video was of the accident flight taxiing out to the departure runway 30 at KSRR. The video included audio and was two minutes and 37 seconds in duration. The video was recorded at a resolution of 2704 x 2028 pixels, referred to as 2.7k, and 60 frames per second (fps). The audio was sampled at 48 kHz from the camera's internal microphone.

The following events were observed at the indicated times as shown in Table 1 and Figures 3 to 6.

Table 1. Observations from Video 1.

Video Elapsed Time (mm:ss)	Observations	Figure
00:01	The video began with the passenger in the forward, right seat holding the GoPro with the camera facing inward (toward the passenger). The passenger door was open. The aircraft was taxiing to the departure runway at KSRR.	
00:18	The passenger's seatbelt was visible and buckled. The seatbelt was a four-point Y-type seatbelt.	
00:49	The pilot's seatbelt was visible and buckled. The seatbelt was a four-point Y-type seatbelt.	
00:50	The camera view changed to forward-facing and the passenger side instrument panel was visible. The aircraft was still taxiing to the departure runway. The tachometer read 1300 rpm and showed a total engine time of 1781.74 hours. The fuel pressure indicator read 3 psi. The manifold pressure indicator read 13 inHg. The suction gauge read 4.75 inHg.	3

Video Elapsed Time (mm:ss)	Observations	Figure
00:59	A larger portion of the instrument panel was visible. The aircraft was still taxiing to the departure runway. The altimeter read approximately 6750 feet. The fuel quantity gauge indicated 51.6 gallons of fuel remaining.	4
01:53	The camera was positioned outside the open passenger door and the right empennage of the aircraft was visible. No damage or inconsistencies were noted.	5
02:00	The camera was moved to show outside the passenger door including the right wing, aileron, and flap. The right flap was in the up position. No damage or inconsistencies were noted.	6
02:37	The aircraft was still taxiing to the departure runway. The video ended.	



Figure 3. View of aircraft taxiing and passenger-side instrument panel.



Figure 4. View of aircraft taxiing and instrument panel.



Figure 5. View of right empennage.



Figure 6. View of right wing.

3.5.2. Summary of Video 2 – Accident flight takeoff and impact with terrain

The second video was of the accident flight taking off from departure runway 30 at KSRR and its subsequent impact with terrain. The video included audio and was nine minutes and 20 seconds in duration. The video was recorded at a resolution of 2704 x 2028 pixels, referred to as 2.7k, and 60 frames per second (fps). The audio was sampled at 48 kHz from the camera's internal microphone.

The following events were observed at the indicated times as shown in Table 2 and Figure 7 to 15.

Table 2. Observations from Video 2¹.

Video Elapsed Time (mm:ss)	Observations	Figure
00:01	The video began with the aircraft holding at the end of runway 30 at KSRR. The camera was positioned with a forward-facing view and most of the instrument panel was visible. The flaps indicator indicated flaps up. The altimeter read 6700 feet. The view out the windshield was unobstructed. The weather was partly cloudy.	7

¹ In the table, the symbol # precedes an expletive.

Video Elapsed Time (mm:ss)	Observations	Figure
00:25	The pilot applied power and the aircraft began to move down the runway. The tachometer indicated 2600 rpm. The fuel pressure indicator read 6.5 psi. The manifold pressure indicator read 22.5 inHg. The suction gauge read approximately 6 inHg.	8
00:38	The pilot stated, "should be at 3000 feet."	
00:59	The aircraft began to pitch up.	9
01:05	The aircraft lifted off the runway.	10
01:19	The aircraft was a few feet off the ground, but still over the runway surface. The aiming point marking for runway 12 was visible ahead. The instrument panel was no longer visible.	11
01:22	The passenger asked, "Gear up?". The pilot replied, "Yeah, gear up." The aircraft began a slight turn to the right.	
01:30	The aircraft was a few feet off the ground. The intersecting runway 6/24 was visible passing below.	12
01:33	The pilot stated, "# [REDACTED], I can't see over the edge." A sound similar to the landing gear retracting was heard.	
01:35	The paved runway surface was no longer visible.	13
01:42	The pilot stated, "# [REDACTED]."	
01:43.0	The camera view moved down and a portion of the instrument panel in front of the passenger was visible. The tachometer indicated 2400 rpm. The landing gear indication indicated gear up. The propeller control lever was in the full forward position. The manifold pressure indicator read 23 inHg. The suction gauge read approximately 5.8 inHg.	14
01:43.5	The camera view moved down and to the left and the lower portion of the instrument panel on the passenger's and pilot's side was visible. The throttle lever was in the full forward position. The mixture control lever appeared to be in-line with the throttle lever and in the full forward (full rich) position. The yoke was being pulled aft.	15
01:44	The aircraft impacted the ground.	

Video Elapsed Time (mm:ss)	Observations	Figure
01:45 to 09:20	Post-impact pilot and passenger movement was noted. Emergency responders arrived. The video ended at 09:20 elapsed time.	



Figure 7. View before takeoff, holding on runway 30.



Figure 8. View after power was applied, aircraft began moving down the runway.



Figure 9. Aircraft began to pitch up.



Figure 10. Aircraft lifted off the runway.



Figure 11. View after takeoff. The aiming point marking for runway 12 was visible ahead.



Figure 12. View with intersecting runway 6/24 passing below.



Figure 13. View with paved runway surface no longer visible.



Figure 14. View of passenger-side instrument panel before impact.

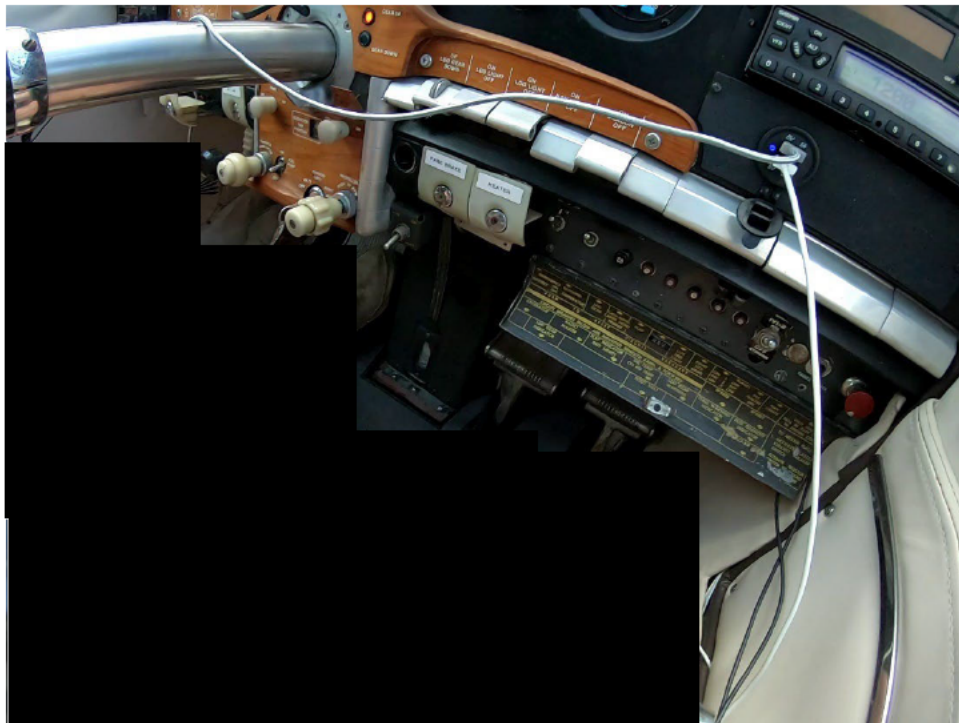


Figure 15. View of the lower portion of the instrument panel before impact.