

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



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ONBOARD IMAGE RECORDER

Group Chair's Factual Report

November 17, 2022

WARNING

The reader of this report is cautioned that the summary of a cockpit voice recorder audio recording is not a precise science but is the best product possible from a National Transportation Safety Board group investigative effort. The summary or parts thereof, if taken out of context, could be misleading. The summary should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the summary as the sole source of information.

A. ACCIDENT

Location: Fort Myers, FL
Date: October 8, 2022
Time: 18:00 eastern daylight time (EDT)
Helicopter: Bell Textron Canada LTD 505, N5DF

B. ONBOARD IMAGE RECORDER GROUP

Group Chair: Sean Payne
Sr. Engineer
National Transportation Safety Board (NTSB)

Group Member: Edwin Miller
Aviation Accident Investigator
Federal Aviation Administration (FAA) – AVP-100

Group Member: Gary Howe
Air Safety Investigator
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Group Member: Bryan Larimore
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SAFRAN H.E. USA

C. DETAILS OF THE INVESTIGATION

A video group was convened on November 15, 2022. The NTSB Vehicle Recorder Division received the following file from a Personal Electronic Device (PED):

Recorder Manufacturer/Model: Unknown PED
Filename: Unknown

1.0 Recorder Description

PEDs are a category of devices comprised primarily of portable computing devices and mobile phones. Portable computing devices are typically capable of internet access, email, messaging services, and can run user-installed applications to perform specific tasks. Depending on the model, mobile phones can perform many of the same tasks as portable computing devices, plus have voice call and text messaging capabilities. PED user and system data is typically stored on non-volatile memory and can be accessed through manufacturer-provided interfaces.

1.1 Video File Description

The recording was made handheld in 16:9 (wide format) and was approximately 2 minutes and 19 seconds in length. The resolution was 1280 by 720 pixels in color. The recording contained an audio track which captured external sounds. The video file may have ended prematurely, as if the final portion of the recording had been cropped with a video editing software. This occurred after the accident occurred, after the PED came to rest. Additional video information was not pursued.

1.2 Timing and Correlation

Timing on the summary is given in video elapsed time. Times of this report are given in elapsed time, in the format MM:SS:FF, where MM stands for the number of elapsed minutes, SS stands for the number of elapsed seconds and FF, the amount of elapsed frames (where necessary).

1.3 Video Summary

The recording was taken from a personal electronic device (PED) from a passenger in the left rear passenger seat of the accident helicopter.

The recording began at 00:00:00, the camera was being panned to the left side of the helicopter. The audio captured sounds consisted with normal operation of the helicopter. This portion of the recording was uneventful. The helicopter was flying a portion of a circular pattern around the accident site. For details on the helicopter's approach to the accident site, see the Cockpit Displays – Specialist's Factual Report which can be found in the public docket for this accident.

At 00:17:00, the helicopter passed over a pond near Gladiolus Drive, Iona, Florida. Figure 1 is a screenshot of the recording at this time. The screenshot has been annotated to show the direction of the wind across the pond with yellow arrows. The arrowhead points toward the direction the wind was blowing.



Figure 1. A screenshot of the recording near Gladiolus Drive, Iona, FL. The yellow arrows indicate the direction of the wind across the pond.

The camera view continued to record outside of the left side of the helicopter as it continued toward the accident site.

At 00:43:00, the helicopter passed over another pond near Hagie Drive & Kelly Road Soccer Complex. Figure 2 is a screenshot of the pond, shown at this time. The screenshot has been annotated to show the direction of the wind across the pond. The arrowhead points toward the direction the wind was blowing. The wind was roughly out of the northeast blowing toward the southwest.



Figure 2. A screenshot of the recording near Hagie Drive and Kelly Road Soccer Complex. The yellow arrows indicate the direction of the wind across the pond.

Around 00:57:00, the camera view panned inside the helicopter and captured the instrument panel. The instrument panel appeared nominal, there were no caution or warning lights, or CAS messages. The instrument panel showed the following:

- The Power Situation Indicator was just above "8"
- The rotor RPM was at 104% (nominal)
- The fuel status appeared to be approximately 3/4 full.
- The attitude indicator suggested the helicopter was nearly level at this time in pitch and roll.

The accident site (Iona Tax Assessor's Office and helipad) is visible ahead of the helicopter. There were two flagpoles ahead of the helicopter annotated in figure 3. The helicopter's heading at this time was WNW. The flags on the flagpole are erect and indicated the wind was blowing from NNE.



Figure 3. A screenshot of the instrument panel at this time. An area of flags are circled. The helipad is annotated.

As the helicopter continued forward toward the accident site, it was apparent that the helicopter was in a right crab (slightly into the wind). The pilot's feet were visible on both tail rotor pedals. It appeared that the left pedal was slightly ahead of the right pedal.

Figure 4 is a cropped image of the flagpole area when it was last visible at approximately 01:00:00.



Figure 4. The flags cropped at approximately 01:00:00.

Figure 5 is a cropped screenshot showing the camera's view at 01:02:00 as it headed toward the accident site. The image was cropped to remove occupants from the image. A pond ahead and to the left shows the wind was blowing from the NNE. The screenshot has been annotated to show the direction of the wind across the pond with yellow arrows. The arrowhead points toward the direction the wind was blowing. The direction of the helicopter's motion is depicted with a red arrow.



Figure 5. A cropped screenshot at 01:02:00. The wind direction across the pond has been annotated. The direction of the helicopter is in red.

The helicopter continued approaching the accident site. At 01:32:00, the camera captured the pilot. The pilot was wearing a shoulder harness. The buckle of the harness was not visible from this angle. The pilot had his right hand on the cyclic and his left hand on the collective. The PFD showed the following:

- The Power Situation Indicator was approaching the yellow arc (approximately a value of "10")
- The rotor RPM was nominal (around 104%).
- The rest of the instrument panel appeared nominal, there were no caution or warning lights, or CAS messages.

The helicopter was beginning to descend. The helicopter had slowed to near zero forward airspeed by this time and was nearly above the accident site.

Around 01:33:00, the right rear passenger was visible. The right rear passenger's four-point harness was nearly centered on his chest (right at his sternum, right below his breast). The right rear passenger was leaning forward.

Around 01:36:00, the camera panned around the cockpit (in and out of the helicopter). The helicopter was descending in a steep approach to the accident site (nearly vertical approach).

Moments later at 01:41:00, the camera captured a pond to the left of the helicopter. The helicopter had nearly zero forward airspeed. Figure 6 is a screenshot at this time. The wind was blowing across the pond from the NNE. The screenshot has been annotated to show the direction of the wind across the pond with yellow arrows. The arrowhead points toward the direction the wind was blowing. The approximate direction of the helicopter's nose is annotated with a red arrow.

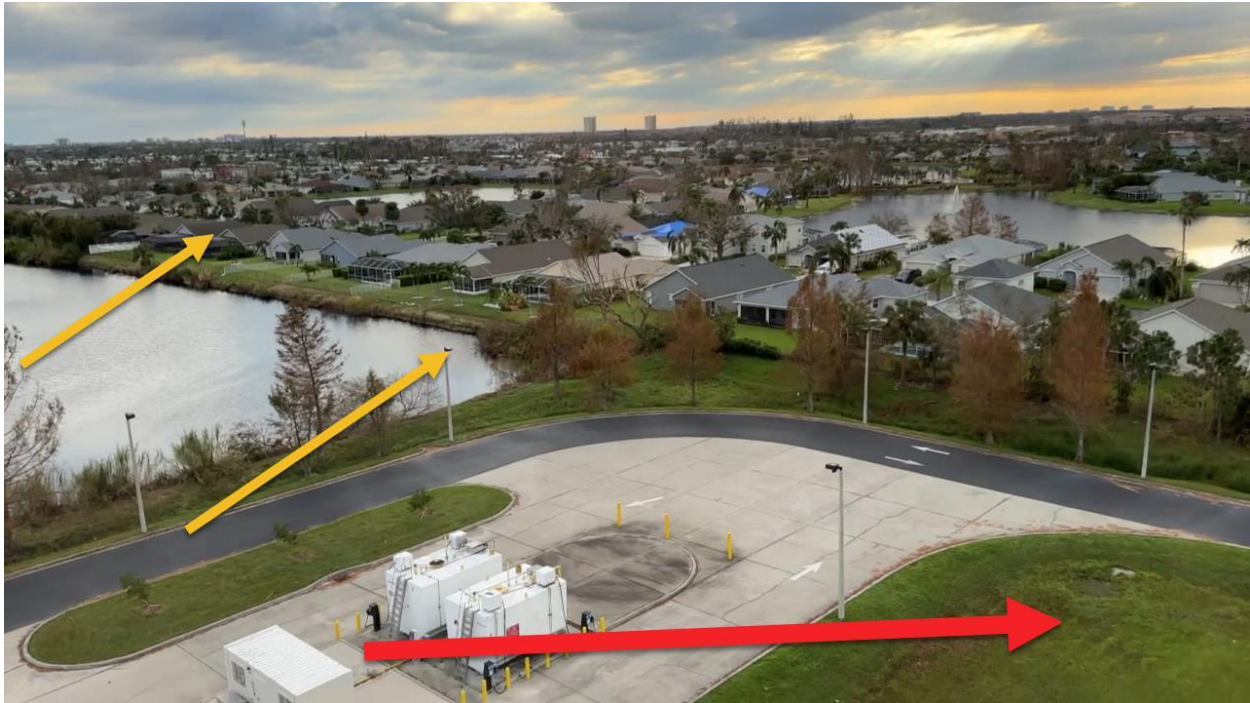


Figure 6. A screenshot at 01:41:00. The wind direction is annotated in yellow, the direction the helicopter's nose was pointed is in red.

Around 01:43:00, the camera view indicated the helicopter began yawing to the right. There was zero forward airspeed. The yaw condition quickly accelerated to the right.

Around 01:47:00, as the helicopter had yawed approximately 90 degrees to the right, the audio captured sounds consistent with an increased frequency followed shortly thereafter by a decreased frequency noise. This noise sounded similar to the engine speed changing RPM, first higher (rapidly) and then lower (rapidly).

One second later (01:47:00), the helicopter had almost completed one full right turn. At this time, audio consistent with a rotor speed decrease was audible. The arms of occupants that were visible appeared to brace themselves within the helicopter.

At 01:49:18, the pilot was gripping the collective and cyclic. The collective appeared to be in a high position (not quite fully up). There was a yellow CAS and red

warning message on the PFD, the resolution of the video was not great enough to define which message exactly. The helicopter was almost level, yawing right rapidly and rolled left as it continued to spin to the right.

At this time, the pilot's upper torso was bent forward¹. The inertial reel shoulder harness was extended, and the pilot's face was close to the glareshield.

At 01:50:24, the recording captured the right rear passenger holding a PED in wide format, consistent with taking a video. This video was unable to be obtained by the NTSB, or party members, at the time this report was written. The right rear passenger's four-point harness was nearly centered on his chest (right at his sternum, right below his breast).

At 01:51:01, pilot and PFD were captured again. The PFD showed the following:

- The power situation indicator was still indicating around "10."
- The rotor RPM was below 104%.
- There was a RED warning and yellow CAS message were displayed on the PFD.
- A red warning light was illuminated on the instrument panel.

The pilot was also visible. His right hand was on the cyclic, his right index finger was on the trigger of the emergency float deployment lever, and his remaining fingers were gripped on the cyclic stick. His upper left arm and bicep were visible; his left arm was in a position to grip the collective. His left forearm muscles appeared "flexed" at this time.

The next few frames captured the pilot as the recording moved around, his body position was similar as noted before, his right hand still on the cyclic and his left forearm was visible flexing in a manner that was consistent with holding the collective. It was unclear if his feet were on the pedals due to the rapid yawing motion of the helicopter to the right.

In the next moment, at 01:52:11, the pilot's left hand was visible on the collective, the collective was in the full up position. His right hand was on the cyclic in the manner described previously (index finger on the trigger of the emergency float deployment lever). The lap belt portion appeared taut around the pilot's pelvis. The

¹ In instances where the group described the pilot's upper torso motion, the rate at which the pilot's torso moved forward did not appear to cause the internal reel to lock.

pilot's buttocks had translated forward in the seat (to the first seam of the seat cushion).

As the next few frames progressed, the pilot's upper body appeared to be thrown forward consistent with the motion of the helicopter. The inertial reel shoulder harness was visible extended out over his shoulders and back to the pilot's seat back. The pilot's lap belt portion of his restraint system was visible. The lap belt portion appeared taut around the pilot's pelvis. The rotary buckle appeared to be in the appropriate position. As his upper body moved forward rapidly, his left arm position remained the same (bent and flexed) and the motion of the pilot's entire upper body appear to have pushed the collective down.

By 01:53:05, the pilot's upper body had been thrown forward more, the shoulder harness was extended out even further (Y strap of the shoulder harness was now visible), his waist was pushed forward in the seat and the lap belt portion of the harness was stretched out in a similar manner (no obvious slack available). The lap belt appeared to be restraining the pilot's waist at this time. This continued for the next second, the collective, when it became visible was in the full down position as the pilot's body was forward and still in the same position (left arm bent and flexed). The PFD no longer showed any warning or CAS messages, the collective was now in a lower position. The helicopter's altitude was level with the light poles near the landing area/accident site.

In the next second, the helicopter's motion suggested it pitched backward, the pilot's upper body moved backward, the pilot's shoulder harness went slack around the pilot's shoulders. The central buckle of the restraint system was visible at this time, the central buckle appeared to be in the pilot's naval region. There was a headset loose and flying in the air in front of the pilot's torso.

At 01:54:00, the left front seat passenger's torso was visible leaning to the right. The shoulder harness was still on his shoulders.

At 01:55:03, a harsh vibration to the recording suggested the first impact of the helicopter with the ground had occurred. The camera appeared to tumble.

At 01:55:19, a frame showed the front door was open and the front left seat passenger was leaning left out of the cockpit.

In the next frame, the left rear seat passenger's upper body was visible. The left rear seat passenger's upper body appeared to be mostly outside of the helicopter, and his body was rotated outboard. The rear door was open.

At 01:55:27, the front left passenger was again visible, his lap belt appeared taut and routed appropriately. The exact geometry of the upper torso was unable to be determined at this time. The front left door was fully open.

In the next frame, the recording showed the helicopter was missing the left skid. The bottom skin of the helicopter was dented and there were visible cracks. The front left passenger seat frame was visible, it was difficult to tell if the seat had stroked at this time.

A few frames later, as the recording continued tumbling, it captured the left skid on the ground along with a blue bag, and a backpack and some other items that seemed to be thrown from the helicopter in subsequent frames.

A still intact main rotor blade came into view at 01:56:12.

In the next frame, the camera appeared to be almost on the ground and facing upward. The camera view captured the helicopter back in the air. Both the front left and rear left doors were fully open. The left rear passenger's body was almost entirely out of the helicopter. The left rear passenger's body was rotated outboard, the bottom of his buttocks and thighs were exposed (not in the seat), but his body appeared to still be restrained. The front left passenger's body was more inside the helicopter than previously noted, his feet were contained inside the helicopter. Both main rotor blades were visible in a super coning position and both main rotor blades were still intact.

The camera kept tumbling, at times a close up of the pavement was visible, and at other times the helicopter was visible. The front left and rear left passenger were visible in similar positioning as noted before.

The camera then faced upward and captured the helicopter above the camera. Both main rotor blades were visible and attached and began chopping through a cyprus-like tree. The right skid was still attached to the helicopter; the emergency floats were not yet deployed. The left rear passenger was still mostly outside of the aircraft but had begun to rotate back inward toward the cabin, the body position of the front left passenger was not as visible but appeared to be mostly inside the helicopter.

At 01:57:27, the tail boom was visible. The tail boom seemed mostly straight; both of the tail rotor blades were absent.

At 01:58:11, the camera came to rest upward. Flying tree needles were visible.

The recording continued until 02:19:11, the sound of the engine was still running after impact and then frequencies that sounded similar to rotational parts moving were audible and quickly spooling down.

During the entire recording of the accident sequence, which was approximately 2 minutes and 19 seconds long, no other aircraft were visible. Additionally, the portion of the recording from the time the recording began until the time the helicopter started descending over the accident site was approximately 1 minute and 41 seconds.

Previous Recordings:

Previous recordings from the same PED that were relevant to the investigation were reviewed. These recordings are summarized by filename below and appear in chronological order.

IMG_5984.MOV

The short video showed the accident helicopter conducting a normal approach to a landing area. The landing area was consistent with where the helicopter would later depart for the accident flight. Nearby smoke indicated the helicopter landed into the wind. The descent toward the landing area was nominal (not shallow, not steep).

The front seat pilot and passenger appeared to be wearing their four-point harnesses. The exact geometry could not be ascertained. The right rear passenger's four-point harness was nearly centered on his chest (right at his sternum, right below his breast).

IMG_6005.MOV

The short video showed the accident helicopter starting at the previous landing area.

The right rear passenger was visible. The right rear passenger's four-point harness was nearly centered on his chest (right at his sternum, right below his breast).

The pilot was wearing his shoulder harness, the lap belt was not visible from this angle, nor the position of the rotary buckle.

The front left passenger was wearing his shoulder harness, the lap belt was not visible from this angle, nor the position of the rotary buckle.

The helicopter remained in ground idle throughout the entire recording.

IMG_6016.MOV

The short recording showed the helicopter taking off on the accident flight. The front occupants (pilot and left seat passenger) harnesses were as described in IMG_6005.mov. The right passengers harness can be described as noted previously. The helicopter was taking off in a direction consistent with what had been the into the wind direction noted during the approach in IMG_5984.mov. As the helicopter departed, the power situation indicator showed "10".

Security Camera Footage

Security camera footage sent to the NTSB was reviewed. The security camera footage appeared to come from the Tax Assessor's building. The recordings are summarized below.

(Helicopter Crash) West - Public Parking 2_2022_10_08_5PM_53_14.mp4

The recording showed the helicopter crashing in the top right corner of the image. The helicopter was yawing to the right and descending with a slight left roll as it came into frame. The first impact was visible.

There were two flags on flagpoles in the distance. The flags were standing nearly erect and waving. The flag positions indicated the wind was coming from approximately the NNE.

West - Employee Near Gate_2022_10_08_5PM_52_32.mp4

The recording was not positioned to show the accident site, however, around 50 seconds elapsed some debris from the crash was visible in the upper left corner of the frame. The trees in the recording were moving consistent with wind blowing prior to the accident, and after the accident occurred. The wind speed could not be quantified. During the time in which the accident occurred (though the helicopter was not visible), some of the trees closer to the accident site were moving vigorously as if they were being blown by rotor wash. The video later showed some sheriff's office personnel responding to the accident.

West - Public Parking 1_2022_10_08_5PM_52_30.mp4

The recording was positioned near the helicopter landing pad but did not capture the accident. The distance of the trees to the recorder were not close enough to resolve any movement. There was some response of nearby personnel captured on the recording. At approximately 19 minutes into the recording, a medivac

helicopter was captured landing on the unoccupied helipad. The helicopter landed in the opposite direction that the accident helicopter approached previously. Given the wind conditions previously noted, the medivac helicopter landed with a left quartering headwind.

YouTube Uploads

Three additional YouTube uploads were provided to the NTSB which captured a portion of the accident sequence. The three recordings were from a security camera system at an unknown location. In general, the recordings were low quality and show the accident helicopter in an unquantified yaw state. In two of the recordings, the camera system's timestamp obscured the helicopter.

All video files are appended to the docket as shelf items.

Surviving Crew Review

As part of the Safety Board's accident investigation process, the pilot was invited to review the CVR transcript and suggest corrections or additions. The pilot visited the NTSB lab and reviewed the recording on March 1, 2023. The pilot did not make any comments.

Submitted by:

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