National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594

CEN22FA331

EXEMPLAR HELICOPTER AND IPAD EXAMINATION SUMMARY

June 16, 2023

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A. ACCIDENT

Location:	North Fork, Idaho
Date:	July 21, 2022
Time:	1644 mountain daylight time (MDT) 2244 coordinated universal time (UTC)
Helicopter:	N388RA, Columbia Helicopters CH-47D

B. PARTICIPANTS

Investigator-In-Charge	Joshua Lindberg National Transportation Safety Board Dallas, Texas
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Party Coordinator	Ely Woods ROTAK Helicopter Services Anchorage, Alaska
Party Coordinator	John Waddell US Forest Service Boise, Idaho
Party Member	Rob Van Horn US Forest Service Ogden, Utah

C. ACCIDENT SUMMARY

On July 21, 2022, about 1644 mountain daylight time, a Columbia Helicopters CH-47D, N388RA, was destroyed when it was involved in an accident near North Fork, Idaho. The pilot and co-pilot were fatally injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 137 aerial firefighting flight.

A 38-second video of the accident was recorded by a ground witness and was provided to investigators. The video showed that the helicopter was setting up to dip the water bucket in the Salmon River. The helicopter was facing east and hovered about 250 ft above the river. Generally, the helicopter began a left yaw turn that continued until the helicopter impacted the river.

D. DETAILS OF THE EXAMINATION

During recovery of the accident helicopter, the flight crew's Apple iPad was found in the river near the cockpit. Figure 1 shows the overall damage to the iPad as recovered. There were three distinct gouge marks on the left side of the iPad and its case, when viewed in portrait mode. The iPad exhibited abend from the back of the case toward the screen. The top two gouges extend from the edge of the case inward into the screen about 3 inches. The bottom gouge is shallower and does not extend into the screen.

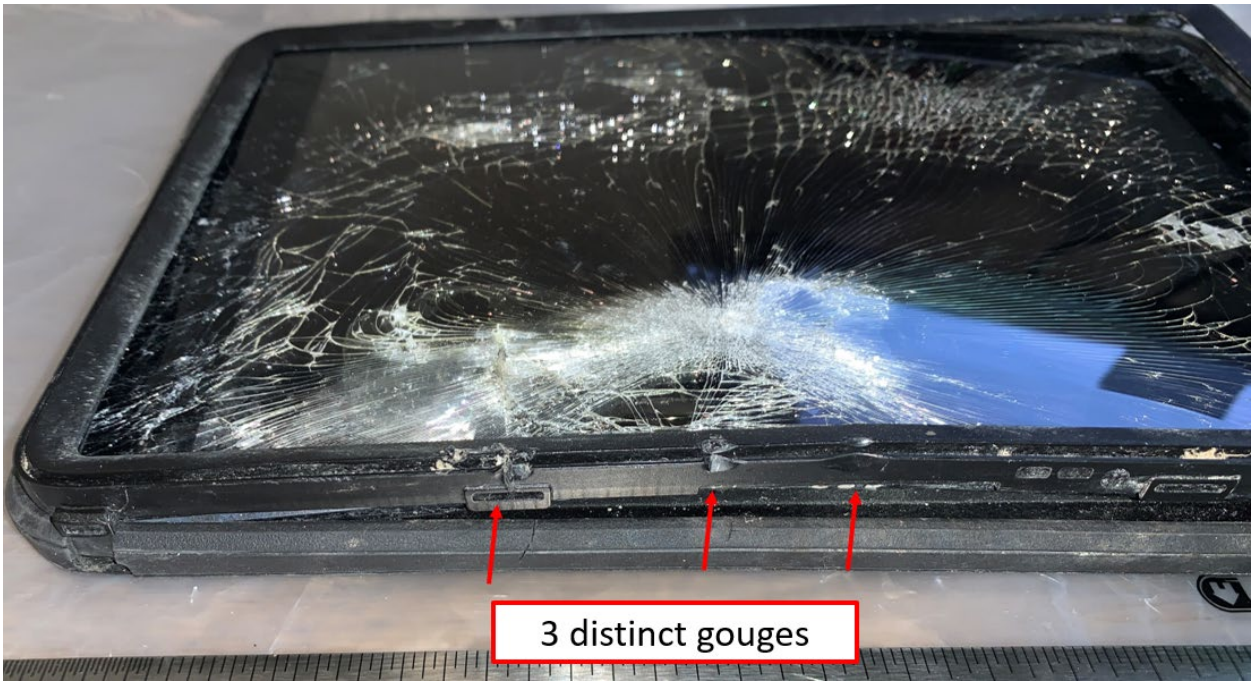

Figure 1. Condition of iPad after the accident with 3 distinct gouges in the iPad and it's case. The gouges are on the left side of the iPad when viewed in portrait mode. In the image, the iPad is rotated left into landscape mode.

To facilitate the examination, the operator provided access to an exemplar Columbia Helicopters CH-47D helicopter whose cockpit was configured similarly to the accident helicopter. The following items were completed:

- Auxiliary power unit turned on.
- Power transfer unit 1 and 2 on to supply hydraulic assisted power.
- Trim release was turned on via the switch on the center console, which unlocked the yaw magnetic brake, resulting in the pedals staying in position once foot pressure was relieved from the pedal.
- On left seat (pilot) controls, left pedal was pushed forward, which resulted in the right seat's (co-pilot) left pedal to also move forward.
- On the co-pilot's side, an iPad was placed between left pedal and airframe, next to the heel slide support assembly.

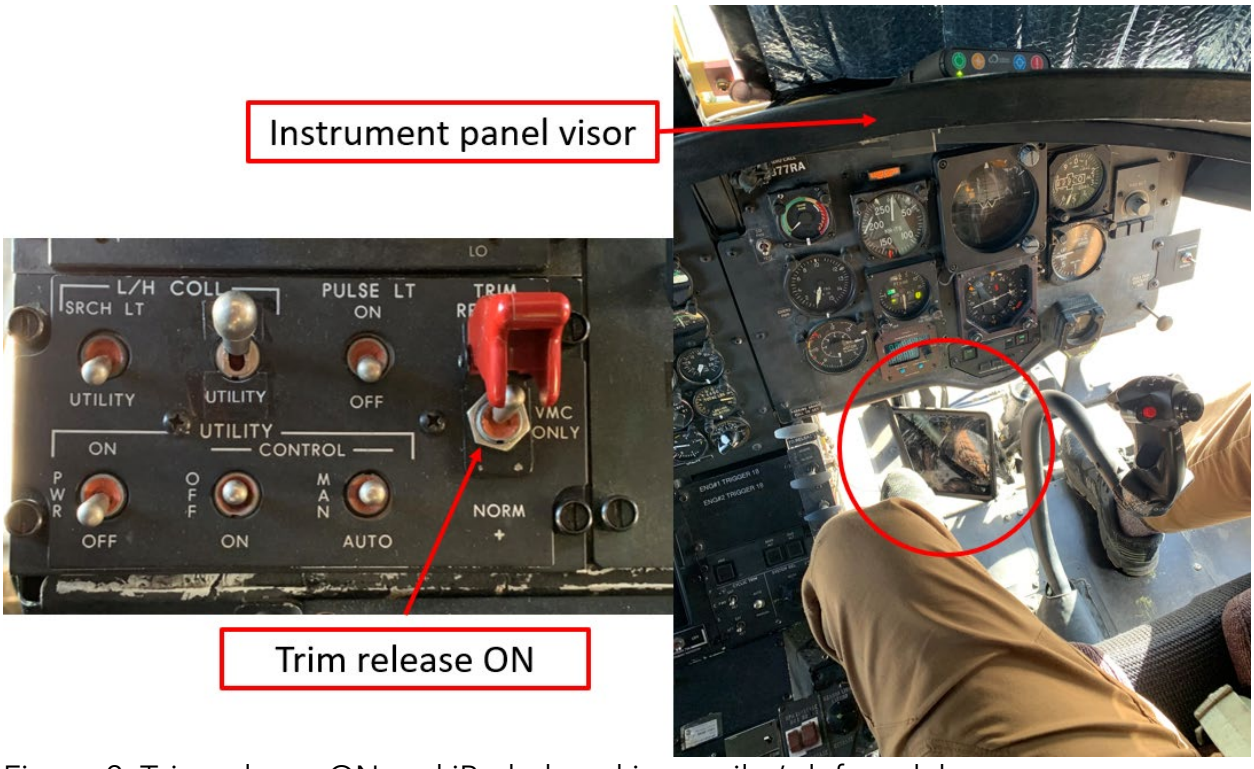

Figure 2. Trim release ON and iPad placed in co-pilot's left pedal area.

Once the iPad was placed in the co-pilot's left pedal area, the pilot's pedals were slowly manipulated in order to determine how the position of the iPad would change. Additional pressure was applied to the pilot's left pedal, which allowed the iPad to fall farther into the left pedal and jam between the heel slide support assembly. The jammed iPad prevented the pedals from recentering. The iPad also pushed against co-pilot's left pedal adjustment lever.

When pressure was applied to the pilot's right pedal, the iPad was squeezed in between the pedal and the heel slide support assembly, which was concentrated near the gouges. The gouges in the iPad aligned with a sharp, vertical metal piece of the heel slide support assembly underneath the heel slide, as seen in Figures 3, 4, and 5. Additional right pedal input forced the iPad to apply more pressure to the co-pilots pedal adjustment lever.

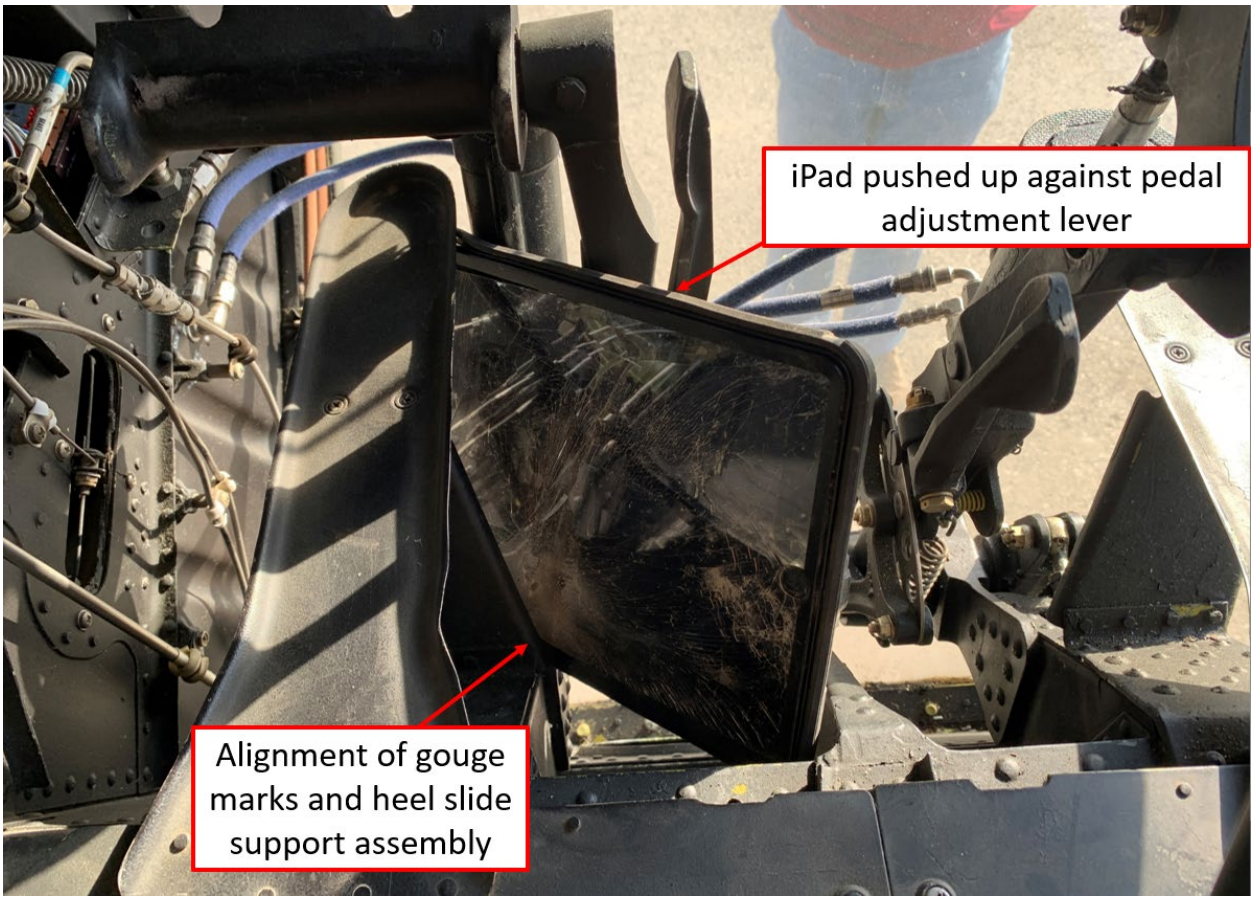

Figure 3. The iPad impinged in between the co-pilot's left pedal and the airframe. The back side of the iPad is pushing against the left pedal adjustment lever. The lower left corner of the iPad is lodged into a small corner of the airframe. The gouges in the iPad aligned with a sharp, vertical metal piece of the heel slide support assembly.

Figure 4. The iPad impinged in between the co-pilot's left pedal and the airframe. The back side of the iPad is pushing against the left pedal adjustment lever. The lower left corner of the iPad is lodged into a small corner of the airframe. The gouges in the iPad aligned with a sharp, vertical metal piece of the heel slide support assembly.

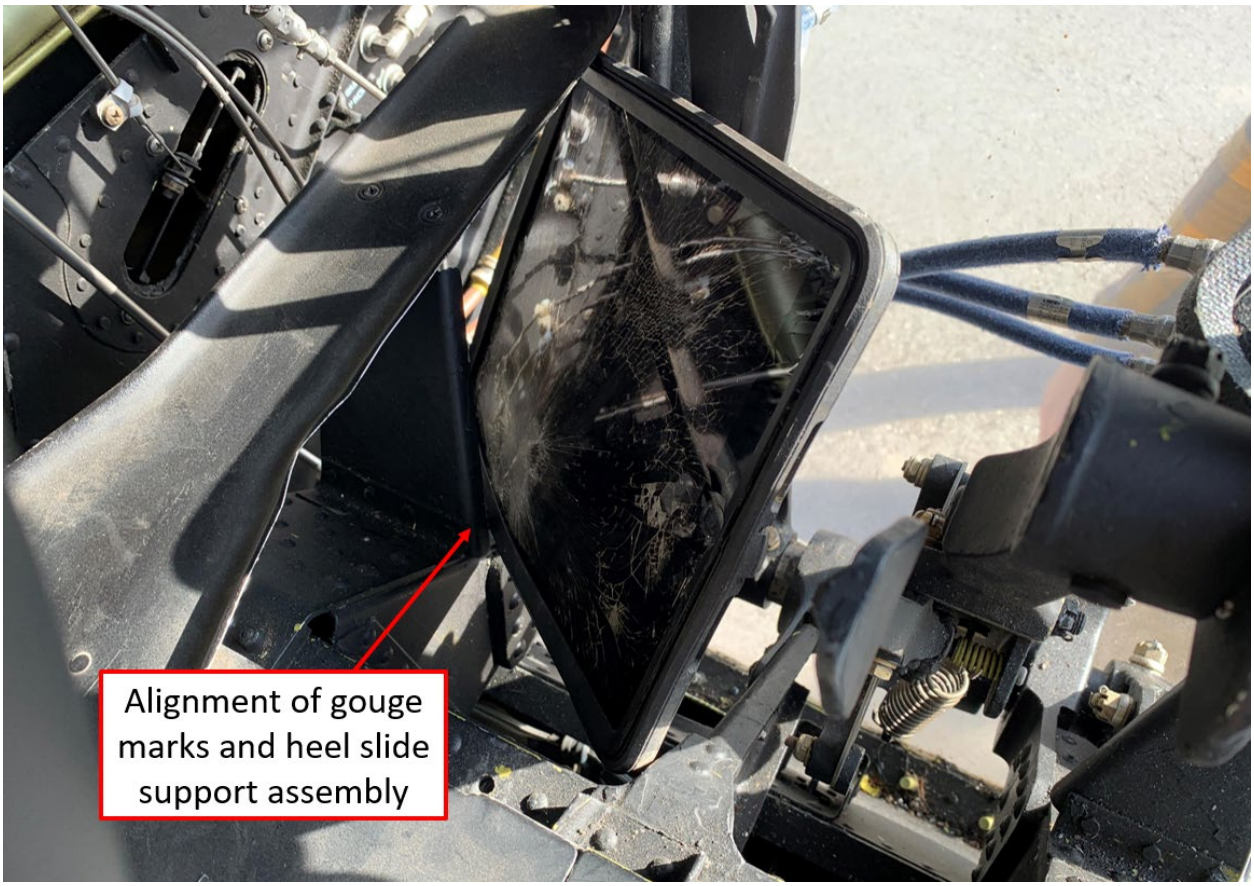

Figure 5. The iPad impinged in between the co-pilot's left pedal and the airframe. The lower left corner of the iPad is lodged into a small corner of the airframe. The gouges in the iPad aligned with a sharp, vertical metal piece of the heel slide support assembly.

Postaccident examination of the accident helicopter, N388RA, revealed that the co-pilot's left pedal was at the forward-most adjustment setting and the co-pilot's right pedal was at the middle adjustment setting.

With the seat restraints on and seats adjusted for comfort, both a 5'7" male and 6'2" male could not reach the iPad in this position. The accident co-pilot's height was 5'10". Additionally, wearing a flight helmet would limit the ability to reach down as the flight helmet would contact the instrument panel visor as seen in Figure 2 and Figure 6.

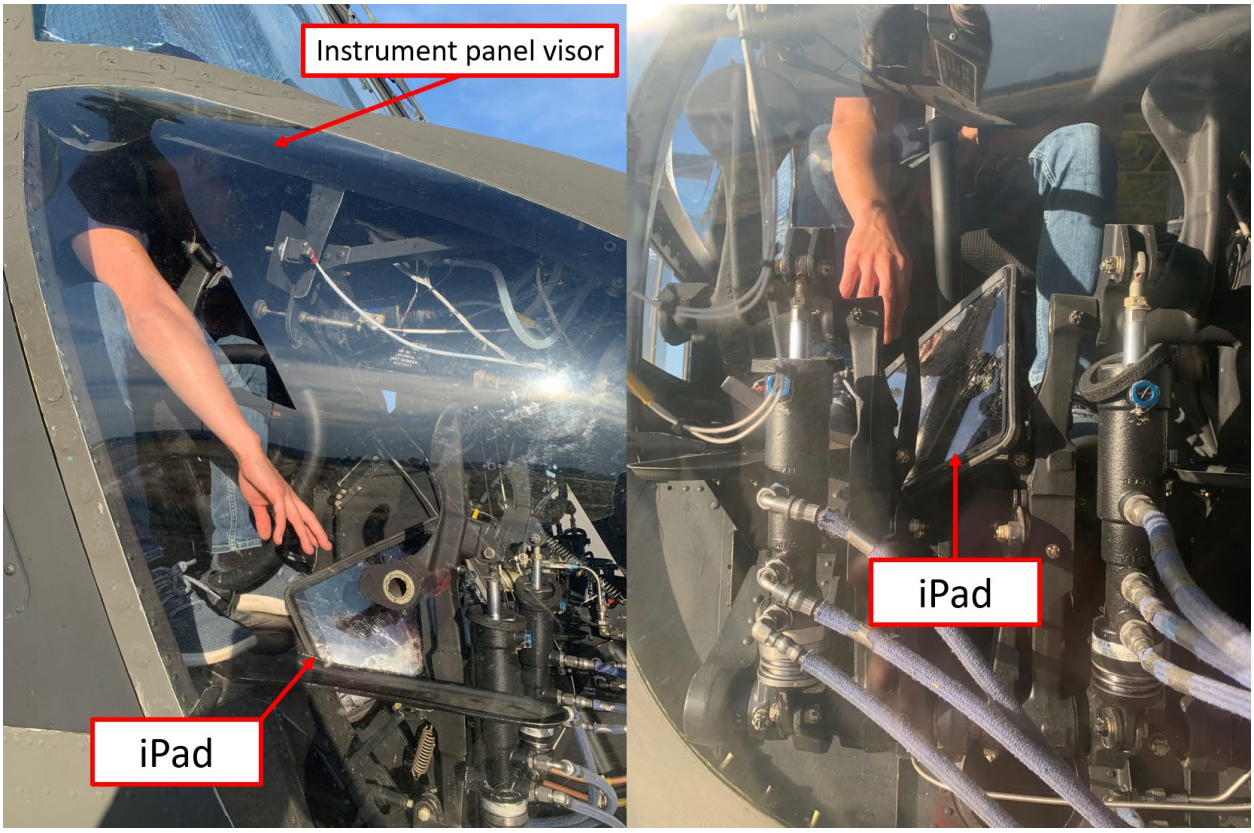

Figure 6. Exemplar 5'7" male wearing seat restraints is reaching for the iPad. The restraints and instrument panel visor prevent the iPad from being accessible.

Submitted by:

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