

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ANC22FA018

COCKPIT VOICE RECORDER

Specialist's Factual Report

February 8, 2023

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 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: Kekaha, Hawaii
Date: February 22, 2022
Time: 1020 Hawaii standard time (HST)
2020 coordinated universal time (UTC)
Helicopter: Croman Corp., Sikorsky S-61N, N615CK

B. COCKPIT VOICE RECORDER SPECIALIST

Specialist Michael Portman
Aerospace Engineer - Recorder Specialist
National Transportation Safety Board (NTSB)

C. FEDERAL CARRIAGE REQUIREMENTS

The accident flight was operated under Title 14 *Code of Federal Regulations* (CFR) 133, external load operations, however, the helicopter often operated under CFR 135. Per federal regulation, multiengine aircraft with more than six passenger seats and requiring two pilots manufactured prior to April 7, 2010, and operated under CFR 135, must be equipped with a cockpit voice recorder (CVR) that records a minimum of the last 30 minutes of aircraft operation; this is accomplished by recording over the oldest audio data. The accident aircraft was manufactured in 1962. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes of CVR operation.

D. DETAILS OF ATHE INVESTIGATION

A CVR group was not convened. The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model: Universal CVR-30B
Part Number: Unknown
Recorder Serial Number: Unknown

1.0 Recorder Description

This model CVR, the Universal CVR-30B, records a minimum of 30 minutes of digital audio stored on solid state memory modules. Four channels are recorded: one channel for each flight crew, one channel for a cockpit observer, and one channel for the cockpit area microphone (CAM).

1.1 Recorder Damage

Upon arrival at the laboratory, it was evident that the exterior of the CVR had sustained heat and structural damage. The outer case was removed, and the interior crash-protected case did not appear to have any heat or structural damage (see figures 1 and 2). The memory board within the crash-protected case was checked for heat or structural damage, and none was found. The digital audio was successfully downloaded from the crash-survivable memory unit using a surrogate.



Figure 1. Exterior of the Universal CVR-30B, as received.

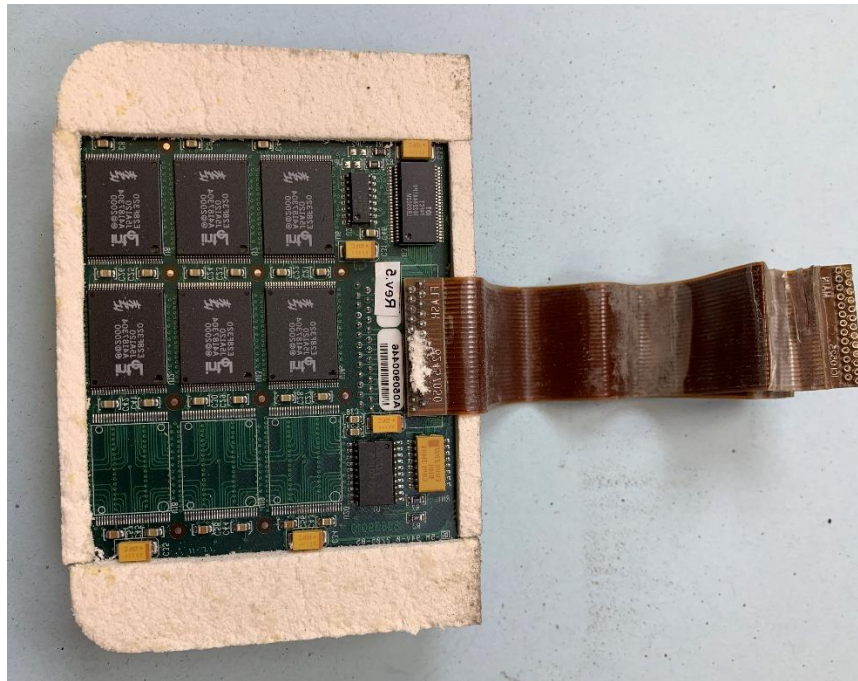


Figure 2. Memory board, removed from the crash survivable memory unit (CSMU).

1.2 Audio Recording Description

Each channel's audio quality is indicated in Table 1.¹

Table 1. Audio Quality

Channel Number	Content/Source	Quality	Duration (mm:ss)
1	Pilot	Good	30:33
2	Co-Pilot	Good	30:33
3	Observer	Good	30:33
4	CAM	Fair	30:33

1.3 Timing and Correlation

The audio was recorded in CVR elapsed time. Due to a lack of available external time information with which to perform a timing correlation, the summary is presented in elapsed time.

1.4 Description of Audio Events

In agreement with the Investigator-In-Charge (IIC), a CVR group did not convene. A summary of events from the CVR follows:

¹ Appendix A comprises the CVR Quality Rating Scale.

Table 2. Summary of CVR audio recording.

CVR Elapsed Time (mm:ss)	Observation
00:00	The recording began. The helicopter was engaged in recovery operations, and the crew coordinated the various elements of their task.
04:04	The recovery operations were completed, and the helicopter began to travel back towards the shore.
04:16	The crew confirmed setting the RPM to "104."
04:24	The crew noted they were approaching 1,000 feet in altitude.
04:48	The crew discussed actions to ensure there was no weight on the hoist arm.
07:03	The crew engaged in conversation about gyro maintenance and compass cards on another helicopter in the fleet.
09:44	The crew engaged in non-pertinent conversation until 14:05.
17:32	The crew obtained ATIS information Charlie, issued at 1915 UTC, including winds from 260 degrees at 4 knots, visibility 10 miles, clear of clouds, temperature 24 degrees Celsius, dewpoint 18 degrees Celsius, and altimeter setting of 30.09 inHg.
19:22	The crew continued non-pertinent conversation until 21:04.
22:17	The crew discussed battery checks and maintenance procedures.
28:05	The crew performed landing checks.
28:12	The crew confirmed gear down.
28:29	The crew called Barking Sands Tower at 1 mile out. They were cleared to land with winds from 250 degrees at 5 knots.
28:49	The crew confirmed landing checks complete as soon as the hoist arm was powered.
29:00	The pilot flying said he would circle around for spot 1.
30:04	The crew confirmed active hoist control.
30:09	The crew mentioned resetting a master caution in relation to a cargo door.
30:19	Unidentified electronic bleed-over noises were noted, possibly the sound of the hoist actuating.
30:26	Discussion was noted similar to the crew beginning altitude/height callouts.
30:26	The pilots began reacting to undetermined problems.
30:27	The pilots repeatedly called out "stick stick stick," and continued reacting throughout the remainder of the recording.
30:33	Sounds consistent with impact were noted. The recording ended shortly thereafter.

Submitted by:

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Aerospace Engineer - Recorder Specialist

APPENDIX A. CVR QUALITY RATING SCALE

The levels of recording quality are characterized by the following traits of the cockpit voice recorder information:

Excellent Quality Virtually all of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate only one or two words that were not intelligible. Any loss in the transcript is usually attributed to simultaneous cockpit/radio transmissions that obscure each other.

Good Quality Most of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions that obscure each other.

Fair Quality The majority of the crew conversations were intelligible. The transcript that was developed may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.

Poor Quality Extraordinary means had to be used to make some of the crew conversations intelligible. The transcript that was developed may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio) or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.

Unusable Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.