

# National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



DCA22LA178

## **COCKPIT VOICE RECORDER**

Specialist's Factual Report

March 7, 2023

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## **A. ACCIDENT**

Location: Atlanta, Georgia  
Date: August 6, 2022  
Time: 21:15 eastern daylight time (EDT)  
Airplane: Boeing 757-200, Delta Air Lines 1696, N540US

## **B. COCKPIT VOICE RECORDER SPECIALIST**

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## **C. FEDERAL CARRIAGE REQUIREMENTS**

The accident aircraft was operating under the provisions of Title 14 *Code of Federal Regulations* (CFR) Part 121 and was required to be equipped with a cockpit voice recorder (CVR) that records a minimum of the last 2 hours of aircraft operation.

## **D. DETAILS OF THE INVESTIGATION**

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

Recorder Manufacturer/Model: Honeywell 6022  
Part Number: 980-6022-001  
Recorder Serial Number: 3403

### **1.0 Recorder Description**

The Honeywell 6022 is a solid-state CVR that records 120 minutes of digital audio. Specifically, it contains a 2-channel recording of the last 120 minutes of operation and separately contains a 3-channel recording of the last 30 minutes of operation. The 120-minute portion of the recording is comprised of one channel that combines three audio panel sources and a second channel that contains the cockpit area microphone (CAM) source. The 30-minute portion of the recording contains 3 channels of audio information: one channel for each flight crew and one channel for a cockpit observer.

### **1.1 Recorder Damage**

The CVR arrived at the laboratory with no visible damage and the audio information was extracted from the recorder normally, without difficulty.

## 1.2 Audio Recording Description

Each channel's audio quality is indicated in Table 1.<sup>1</sup>

**Table 1:** Audio Quality.

| Channel Number | Content/Source | Quality   | Duration |
|----------------|----------------|-----------|----------|
| 1              | Pilot          | Excellent | 00:30:25 |
| 2              | Copilot        | Excellent | 00:30:25 |
| 3              | Observer       | Excellent | 00:30:25 |
| 4              | Combined 1/2/3 | Excellent | 02:05:32 |
| 5              | CAM            | Good      | 02:00:43 |

The recording consisted of five channels of audio information, however, none of the audio was pertinent to the accident investigation. The audio was consistent with the CVR being overwritten or recorded over by subsequent events.

Characteristics of overwritten CVRs include:

- The audio is consistent with the airplane being stationary on the ground with electrical power on.
- Post-accident conversations or sounds that are irrelevant, or do not provide any additional information useful to the investigation.
- Conversations or other audio are consistent with maintenance personnel working in or near the cockpit.
- Conversations or other audio indicating the airplane is taxiing after an incident.
- Background sounds in an unoccupied cockpit such as:
  - Radio transmission from other aircraft or ground facilities.
  - Unintelligible or difficult-to-discern conversation or other sounds likely emanating from the cabin or outside the airplane.

Submitted by:

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<sup>1</sup> Appendix A comprises the CVR Quality Rating Scale.

## 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.