

National Transportation Safety Board

Office of Research and Engineering

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COCKPIT VOICE RECORDER

Specialist's Factual Report

April 25, 2024

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.

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A. ACCIDENT

Location: Montgomery, Alabama
Date: December 31, 2022
Time: 1539 central standard time (CST)
Airplane: Embraer ERJ 170-200, Envoy Air dba American Eagle, N264NN

B. COCKPIT VOICE RECORDER SPECIALIST

Specialist Charles Cates
Mechanical Engineer/Recorder Specialist
National Transportation Safety Board (NTSB)

C. FEDERAL CARRIAGE REQUIREMENTS

The event aircraft, N264NN, was operating as a Title 14 *Code of Federal Regulations* (CFR) Part 121 regularly scheduled domestic passenger flight. It was operating such that it 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: Universal CVFDR 1605
Part Number: 1605-01-00
Recorder Serial Number: 1040

1.0 Recorder Description

This model CVR, the Universal 1605, records a minimum of 120 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 CVR had not sustained any heat or structural 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 1.¹

Table 1: Audio Quality

Channel Number	Content/Source	Quality	Duration
1	Observer (unoccupied)	Excellent	120 min
2	First Officer	Excellent	120 min
3	Captain	Excellent	120 min
4	Cockpit Area Microphone (CAM)	Excellent	120 min

1.3 Timing and Correlation

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, the aircraft touchdown, last radio transmission that the aircraft made, and power down were correlated to the audio events and radio transmit microphone key parameter from the FDR. Each of the events acted as an anchor point for a linear interpolation between the remaining CVR events. Once a correlation between the two recorders was established, a reference to local time was determined. The CVR and FDR times were offset to reflect the local central standard time of the accident.

1.4 Description of Audio Events

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

The recording began at 1348:21 with the aircraft on the ground at Dallas Fort Worth Airport (DFW). The flight to Montgomery Regional Airport (MGM) was uneventful. The aircraft landed at MGM at 1535:13.

While taxiing to the gate the first officer (FO) said, "So we'll see if they try and open the doors with the engine on." The captain replied, "Yeah like those knuckleheads in Dallas?"²

At 1538:38 the crew verbally confirmed shut down of the number two [right hand] engine. They then discussed that they would leave the seatbelt sign illuminated and at 1539:11 the captain made a cabin announcement asking passengers to remain seated until they can shut down the engine and extinguish the seat belt sign. During the captain's cabin announcement at 1539:13 two triple chimes were annunciated.

¹ Appendix A comprises the CVR Quality Rating Scale.

² Piedmont Airlines did not provide ground handling services for Envoy Airlines at Dallas Fort Worth International Airport.

After the captain's announcement was complete, at 1539:45 the CAM recorded the sound of a thump and a rattling noise, and the engine could then be heard spooling down. A series of chimes and triple chimes were annunciated. The FO asked, "What was that? Did somebody just go into the engine?" He then said, "Something just hit us."

Following the event, the captain left the flight deck to investigate in the cabin. The FO spoke with a person on the ground through the flight deck window and confirmed that a person was pulled through the engine.

The recording ended at 1551:01.

Submitted by:

Charles Cates
Mechanical 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.