

National Transportation Safety Board

Office of Research and Engineering

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ENG22LA002

COCKPIT VOICE RECORDER

Specialist's Factual Report

September 6, 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 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. INCIDENT

Location: Atlantic City, New Jersey
Date: October 2, 2021
Time: 1714 eastern daylight time (EDT)
Airplane: Airbus A320-271N, Spirit Airlines, N922NK, NK3044

B. COCKPIT VOICE RECORDER SPECIALIST

Specialist Michael Portman
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C. FEDERAL CARRIAGE REQUIREMENTS

Per federal regulation, turbine engine powered aircraft operating under Title 14 *Code of Federal Regulations* (CFR) Part 121 must be equipped with a cockpit voice recorder (CVR) that records a minimum of the last 2 hours of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 2 hours of CVR operation.

D. DETAILS OF ATHE INVESTIGATION

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

Recorder Manufacturer/Model: Honeywell HFR5-V
Part Number: 980-6032-023
Recorder Serial Number: CVR-08601

1.0 Recorder Description

This model CVR, the Honeywell HFR5-V, 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 (HH:MM:SS)
1	Captain	Excellent	02:10:24
2	First Officer	Excellent	02:10:24
3	Observer/PA	Excellent	02:10:24
4	CAM	Excellent	03:12:12

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 last three radio transmissions that the aircraft made were correlated to the radio transmit microphone key parameter from the FDR. Each of the three radio transmissions 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 EDT 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 first approximately 2 hours and 27 minutes of the recording contained the previous flight into and landing at Atlantic City International Airport (KACY), Atlantic City, New Jersey. These events transpired uneventfully. The event recording began at 17:06:23, with the airplane on the ground during preflight and boarding. The following observations were made, as shown in table 2.

Table 2: Summary of Observations from the CVR.

Time EDT (HH:MM:SS)	Observation
17:06:23 - 17:14:01	The crew performed various preflight activities including programming the FMS, accomplished various checklists, and performed a walkaround.

¹ Appendix A comprises the CVR Quality Rating Scale.

Time EDT (HH:MM:SS)	Observation
17:14:01	The crew obtained Atlantic City ATIS information D, issued at 20:54 zulu (16:54 EDT), including winds from 230 degrees at 10 knots, visibility 10 miles, skies clear, temperature 24 degrees Celsius, dewpoint 14 degrees Celsius, altimeter setting of 30.08 inHg, with traffic landing and departing on runway 22.
17:16:01	The crew completed a takeoff and departure briefing.
17:18:00	The crew began a before start checklist.
17:32:44	The cockpit door was closed.
17:32:57	The crew completed the before start checklist.
17:33:15	The pushback sequence commenced and completed without issue.
17:34:31	The #1 engine was started.
17:36:37	The #2 engine was started.
17:37:52	The crew ran the after start checklist.
17:38:24	The crew called for taxi, were cleared to taxi to runway 22, and subsequently requested runway 31 instead, which was approved.
17:40:05	The crew ran a before takeoff checklist and briefing, including the V speeds of V1 125 knots, Vr 130 knots, V2 132 knots, and a flex takeoff power setting of 65%.
17:42:34	The crew called Atlantic City tower reporting ready for takeoff. Tower responded shortly thereafter clearing the flight for takeoff on runway 31.
17:43:34	An increase in ambient noise consistent with throttle up was noted.
17:44:05	The crew confirmed thrust was set.
14:44:10	The crew called out 100 knots.
17:44:12	The crew noted on the presence of a bird.
17:44:13	Sounds consistent with a birdstrike were noted, including significant vibration noises. The crew immediately transferred controls and aborted the takeoff.
17:44:17	The crew confirmed spoiler deployment and thrust reversers shortly thereafter.
17:44:23	The crew advised ATC of the birdstrike and that they were stopping on the runway.
17:44:27	The crew noted high #2 engine vibrations on the ECAM and proceeded to run an emergency checklist.
17:44:37	ATC asked if the crew needed assistance, and the crew asked for them to send the ARFF trucks.
17:45:04	ATC notified the crew that there appeared to be a fire underneath the #2 engine. The crew acknowledged and repeated their request for ARFF trucks.

Time EDT (HH:MM:SS)	Observation
17:45:05	The fire bell sounded.
17:45:13	A PA from a flight attendant was audible instructing the passengers to stay seated.
17:45:29	A flight attendant called the pilots to inform them the passengers had begun disembarking.
17:45:39	The flight attendant asked if they need to evacuate; the pilots responded not yet.
17:46:06	The flight attendant called back to ask to open the front doors, informing the pilots that the passengers had opened the back doors. As a result, the pilots switched checklists and began to run the emergency evacuation checklist.
17:46:58	The crew called for passengers to evacuate, announcing "evacuate evacuate evacuate...right hand engine...has caught on fire we hit a bird on takeoff...all right please avoid the right hand engine."
17:47:12	The crew informed ATC they were evacuating.
17:47:17	Flight attendants were audible in the background instructing passengers to evacuate and to leave everything behind.
17:47:45	The crew discussed evacuation strategy, including which doors each of them would exit and what items they would take with them.
17:48:50	The crew briefly called company ops to inform them of the situation.
17:50:02	For the remainder of the recording, various conversations were noted including about a passenger who needed assistance and could not speak English.
17:51:45	End of recording.

Submitted by:

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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.