

**NATIONAL TRANSPORTATION SAFETY BOARD**  
Vehicle Recorder Division

September 29, 2020

## **Cockpit Voice Recorder**

**Specialist's Factual Report**  
**By Kyle Garner**

### **1. EVENT SUMMARY**

Location: Sacramento, California  
Date: February 15, 2020  
Aircraft: Airbus A319, registration N521NK  
Operator: Spirit Airlines  
NTSB Number: ENG20LA016

On February 15, 2020, at about 1100 Pacific standard time (PST), an Airbus A319-132, registration N521NK, lost all electronics while on approach to Sacramento International Airport (KSMF), Sacramento, California. The flight crew switched to auxiliary power and landed uneventfully. The airplane was towed to the gate, and passengers deplaned normally. There were no reported injuries to the 112 passengers and 5 crew members. The flight was operating under the provisions of Title 14 *Code of Federal Regulations* (CFR) Part 121, as a scheduled domestic passenger flight and originated from McCarran International Airport (KLAS), Las Vegas, Nevada. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Division for evaluation.

### **2. COCKPIT VOICE RECORDER GROUP**

A cockpit voice recorder group was not convened.

### **3. DETAILS OF INVESTIGATION**

The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model: **Honeywell P/N 980-6022-001**  
Recorder Serial Number: **1220**

#### **3.1 CVR Carriage Requirements**

The event aircraft, N521NK, was manufactured in 2006 and was operating such that it was required to be equipped with a CVR that recorded, at minimum, the last two hours of aircraft operation as cited in Title 14 CFR Part 121.359.

## 3.2 Recorder Description

This model CVR, the Honeywell 6022, is a solid-state CVR that records at minimum two hours of digital audio from four input channels – one channel for each crew member (captain, first officer, and observer) and one channel for the cockpit area microphone (CAM). The four channels are processed to create five distinct audio files: one 30-minute file for each channel, one 2-hour file for the CAM, and one 2-hour file of channels 1, 2, and 3 combined. The recording structure is summarized in Figure 1.

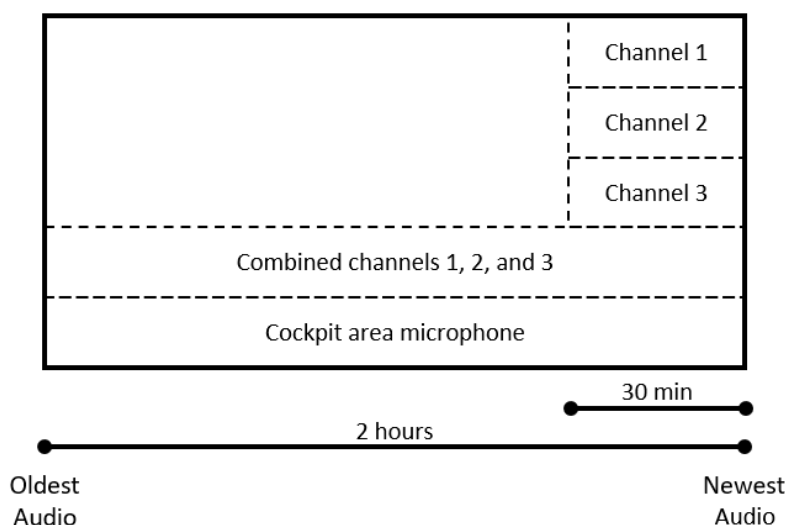


Figure 1. Summary of Honeywell 6022 recording structure.

## 3.3 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.

## 3.4 Audio Recording Quality Description

The audio quality for each file is indicated in Table 1.<sup>1</sup>

| Table 1: Audio Quality. |                |           |                     |
|-------------------------|----------------|-----------|---------------------|
| File Number             | Content/Source | Quality   | Duration (hh:mm:ss) |
| 1                       | Captain        | Excellent | 00:30:22            |
| 2                       | First Officer  | Excellent | 00:30:22            |
| 3                       | Observer       | Excellent | 00:30:22            |
| 4                       | Combined 1/2/3 | Good      | 02:01:03            |
| 5                       | CAM            | Good      | 02:04:55            |

<sup>1</sup> See Attachment I – CVR Quality Rating Scale.

### 3.5 Summary of Recorded Events

The recording began with a crew discussing non-pertinent events in cruise and ended after the aircraft had landed and parked at a gate at KLAS. It was determined that the recording was not of the event flight, but rather the flight prior to the event flight. Further, it was determined that the aircraft had a similar inflight dual generator failure the previous day, which was two flight legs prior to the event leg.

Table 2 lists details about the event flight, the uneventful flight before the event flight, and another flight with a similar issue the day prior.

**Table 2. Flight Information.**

| <b>Report Designation</b> | <b>Flight Date</b> | <b>Flight Number</b> | <b>Origin</b> | <b>Destination</b>                                | <b>Summary</b>                                                                     |
|---------------------------|--------------------|----------------------|---------------|---------------------------------------------------|------------------------------------------------------------------------------------|
| Flight #1                 | 02/14/2020         | NK806                | KLAS          | Hartsfield – Jackson Atlanta Int’l Airport (KATL) | Inflight dual generator failure. Aircraft landed without further incident at KATL. |
| Flight #2                 | 02/14/2020         | NK805                | KATL          | KLAS                                              | Uneventful flight                                                                  |
| Flight #3                 | 02/15/2020         | NK1818               | KLAS          | KSMF                                              | Inflight dual generator failure. Aircraft landed without further incident at KSMF. |

The operator was notified that the CVR did not contain audio from flight #3. The operator stated that a request was made from their maintenance and engineering department to pull the CVR circuit breaker on the aircraft after the dual generator failure on flight #1 to preserve the recording from that flight. However, the request to pull the circuit breaker in KATL after flight #1 did not reach the appropriate maintenance personnel before the aircraft departed for KLAS on flight #2. The CVR circuit breaker was then pulled after the aircraft arrived in KLAS. As a result, the CVR audio preserved was from flight #2 and the CVR was not powered during flight #3.

The operator was asked to provide documentation detailing when and where the CVR circuit breaker was pulled, however, the operator was unable to provide any documentation related to this request.

## Attachment I

### CVR Quality Rating Scale

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

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Excellent Quality</b> | 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.                                                                                                                                                                                                                             |
| <b>Good Quality</b>      | 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.                                                                                                                                    |
| <b>Fair Quality</b>      | 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.                                                                                                                                      |
| <b>Poor Quality</b>      | 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. |
| <b>Unusable</b>          | 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.                                                                                                                                                                                                                                                           |