NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Vehicle Recorder Division
Washington, D.C.

SPECIALIST'S FACTUAL REPORT OF INVESTIGATION

ERA21LA036

By
Kyle Garner

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 an NTSB 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.

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

May 14, 2021

Cockpit Voice Recorder

Specialist's Factual Report
By Kyle Garner

1. EVENT

Location:	Fernandina Beach, Florida
Date:	November 01, 2020
Aircraft:	Raytheon 400A
Registration:	N456FL
Operator:	Georgia Jet Inc.
NTSB Number:	ERA21LA036

A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Division for evaluation.

2. GROUP

A CVR group was not convened.

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model:	**L-3/Fairchild FA2100-1020**
Recorder Serial Number:	**00274740**

3.1 CVR Carriage Requirements

Per federal regulation, multiengine turbine-powered aircraft with more than six passenger seats and requiring two pilots manufactured before April 7, 2010 and operated under 14 *Code of Federal Regulations* Part 135, must be equipped with a CVR that records a minimum of the last 30 minutes of aircraft operation.

3.2 Recorder Description

This model CVR, an L-3/Fairchild FA2100-1020, is a solid-state CVR that records a minimum of 120 minutes of digital audio. Specifically, it contains a standard quality (SQ) 2-channel recording of the last 120 minutes of operation and separately contains a high quality (HQ) 4-channel recording of the last 30 minutes of operation. The SQ 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 HQ 30-minute portion of the recording contains 4 channels of audio information: one channel for each flight crew, one channel for a cockpit observer, and

one channel for the CAM. A visual representation of this recording structure is shown in Figure 1.

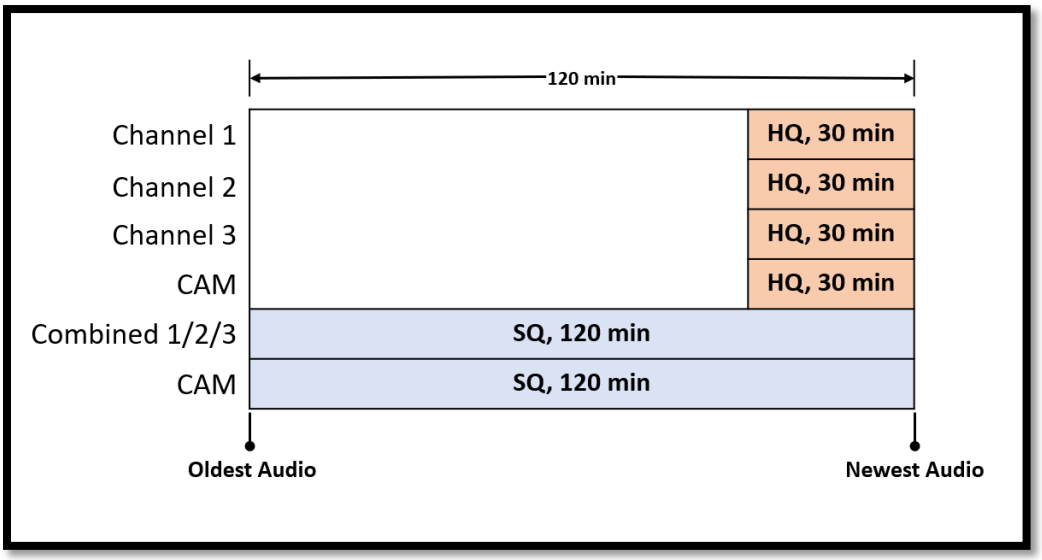

Figure 1. Event CVR recording structure.

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. The CVR, as received, is shown in Figure 2.

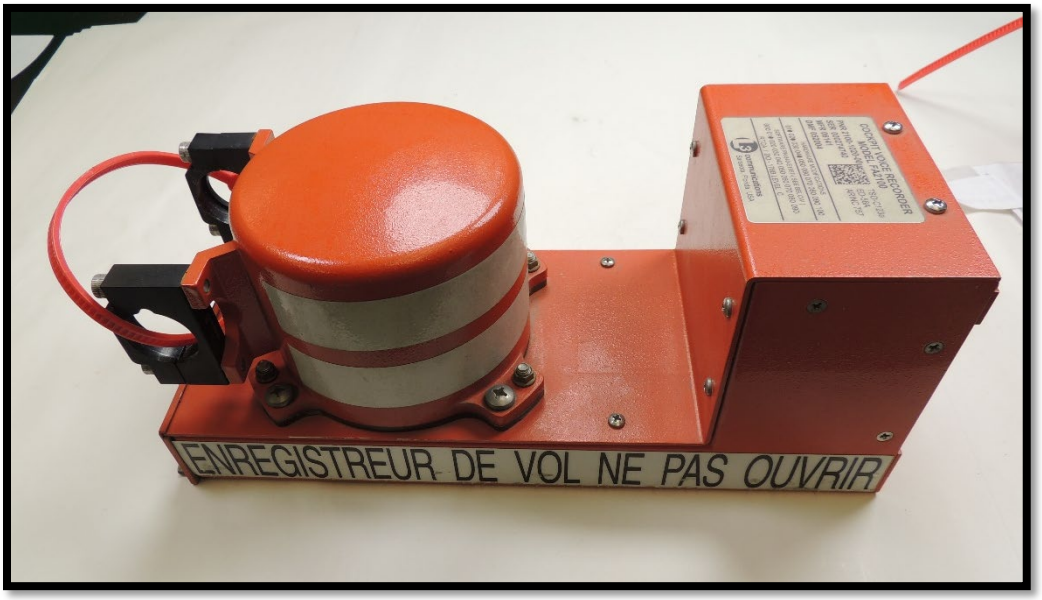

Figure 2. Event CVR, as received.

3.4 Audio Recording Description

Each channel's content, recording quality, and duration are indicated in Table 1.

Table 1: Audio Content, duration, and quality[1].

	Channel	Content/Source	Designed Duration	Actual Duration (hh:mm:ss)	Recording Quality
Cockpit Audio Inputs – HQ	1	3rd Crew Member/Spare	30 min	00:31:03	Good
	2	Co-Pilot		00:31:03	Good
	3	Pilot		00:31:03	Good
	4	CAM HQ		00:30:49	Good
Combined Channels - SQ	Combined	Combined 1/2/3	2 hour	02:04:15	Fair
	CAM	CAM SQ		02:04:15	Fair

3.5 Timing and Correlation

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, radio transmissions that the aircraft made during the event flight were correlated to the radio transmit microphone key parameter from the FDR. Each of the radio transmissions acted as an anchor point for linear interpolation between the remaining CVR events. Once a correlation between the two recorders was established, a reference to the local time zone, Eastern Standard Time (EST), was determined.

3.6 Description of Audio Events

In agreement with the Investigator-In-Charge, a CVR group did not convene. Table 2 provides a list of events from the 30-minute cockpit audio input channels relevant to the investigation on the recording. The 2-hour combined channels were reviewed and did not have any additional information relevant to the investigation not contained on the 30-minute channels.

For the event flight, the pilot in the left seat was the pilot flying (PF) and the pilot in the right seat was the pilot monitoring (PM).

[1] See attached CVR Quality Rating Scale.

Table 2. Summary of CVR events.

EST of observation, hh:mm:ss ***(time before/after touchdown (T), mm:ss)***	**Detail of observation**
13:35:23 *(T-24:48)*	*[30-minute cockpit audio input channels started.]* The aircraft was in cruise with a destination of Fernandina Beach Municipal Airport (FHB) in Fernandina Beach, Florida.
13:35:43 *(T-24:28)*	The PM radioed a fixed-base operator (FBO) at FHB and stated that they would be landing at the airport in approximately 10 minutes.
13:37:22 *(T-22:49)*	Air traffic control radioed the aircraft and stated that they would be entering an area of moderate to heavy participation in the next 1.5 miles and that there was also an area of heavy to moderate precipitation directly over FHB. The flight crew discussed the weather over the airport and which runway to use. The flight crew stated that they had plenty of fuel for holding if the weather over the airport did not improve before their arrival.
13:39:21 *(T-20:50)*	The flight crew checked in with an approach controller and stated they were passing 17,000 feet for 13,000 feet.
13:44:55 *(T-15:16)*	The approach controller radioed the flight crew and stated that the weather was still over FHB and inquired as to what type of approach to the airport they would prefer. The flight crew replied that they had extra fuel and would like to try a visual approach and if not able, they would plan on an instrument approach to runway 13.
13:46:32 *(T-13:39)*	The flight crew checked in with a different approach controller and reported they had the weather at FHB and they were descending through 7,000 feet for 5,000 feet. The controller asked the flight crew if they would like an area navigation (RNAV) approach due to the heavy precipitation over FHB. The flight crew replied by asking for a descent to 3,500 feet to see if they could continue with a visual approach. The controller instructed the flight crew to descend to 3,000 feet and proceed direct to FHB.

EST of observation, hh:mm:ss ***(time before/after touchdown (T), mm:ss)***	**Detail of observation**
13:49:46 *(T-10:25)*	The flight crew requested a descent to 2,500 feet, which was approved by the controller. Upon reaching 2,500 feet, the flight crew discussed how they were still in instrument flight rules (IFR) conditions. The flight crew asked the approach controller for vectors for the RNAV approach to runway 13. The PM stated that if needed, they could hold at ACAPU[2] before attempting the approach.
13:52:22 *(T-07:49)*	The PM stated that they should attempt the approach. The PF responded in agreement noting that the reported weather was "just a little rain shower" and that he didn't expect that there would be any concerns about windshear. The flight crew checked the automated weather observing system (AWOS) for FHB, which reported winds as "1-2-0 at 4 gusting to 1-8".
13:55:25 *(T-04:46)*	The approach controller cleared the flight crew for the RNAV approach to runway 13.
13:57:39 *(T-02:32)*	The flight crew performed the before landing checklist and stated that the gear was down with three green and the flaps were indicating 30 degrees.
13:58:04 *(T-02:07)*	The PM stated, "I got you at ref [V_{ref}][3] plus 20". The PF acknowledged.
13:58:30 *(T-01:41)*	The PF stated, "we'll probably just go hold for 15 minutes and try it again". The PM replied, "yeah, you got a 22-knot tailwind". The flight crew continued the approach.

[2] ACAPU is a waypoint listed on the RNAV runway 13 approach chart for FHB.
[3] V_{ref} = reference landing speed

EST of observation, hh:mm:ss ***(time before/after touchdown (T), mm:ss)***	**Detail of observation**
13:59:05 *(T-01:06)*	The PM reported 300 feet to minimums and stated that he had the runway in sight. The PF stated he had the runway in sight they would continue the approach. The PM reported on the common traffic advisory frequency (CTAF) that they had visual of runway 13 and would be landing. The PM canceled the IFR clearance with the approach controller.
13:59:52 *(T-00:19)*	The PM stated, “speed’s good. hold whatcha got and put her on down. still got a tailwind [unintelligible]”.
14:00:11 *(T)*	A sound similar to the aircraft touching down on the runway was heard. The PM stated the speed brakes indicated deployed. The PF replied, “except it won’t stop”. The PM reported the indicated speed as 105 knots. The PF repeated, “it won’t stop. hang on”. Four alert tones similar to the landing gear warning tone were heard. The PF stated, “anti-skid off” and the PM replied, “anti-skid’s off”. The PF told the passengers to hold on. The PM stated, “go around” and the PF replied, “I can’t go around”, to which the PM replied, “okay”.
14:00:35 *(T+00:24)*	The PF stated that they would be going through the airport fence. A sound similar to the aircraft departing the paved surface was heard. After the aircraft came to a stop, the PF told the passengers they had just hydroplaned and needed to exit the aircraft. The PF stated, “man those brakes did not work at all”. The PM replied, “nope”.

EST of observation, hh:mm:ss ***(time before/after touchdown (T), mm:ss)***	**Detail of observation**
14:04:00 *(T+03:49)*	*[Event flight recording ended. The recording resumed when the aircraft was briefly powered on during the recovery process, however, these events were not relevant to the investigation.]*

Attachment I

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.