

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

February 5, 2019

Cockpit Voice Recorder

Specialist's Factual Report
By Christopher Babcock

1. EVENT SUMMARY

Location: Michigan City, Indiana
Date: December 18, 2017
Aircraft: Cessna 525A, Registration N525KT
Operator: Integrated Flight Resources, Inc
NTSB Number: CEN18LA062

On December 27, 2017, at 0650 central standard time, a Cessna 525A, registration N525KT, impacted an airport fence, highway barrier, and terrain during a landing overrun on runway 20 at Michigan City Municipal Airport-Phillips Field (MGC), Michigan City, Indiana. The airplane came to rest in a corn field about 300 yards from the departure end of the runway 20. The airplane sustained substantial damage, which included separation of the left wing near the wing root and impact damage to the vertical stabilizer. The pilot and copilot received minor injuries. The airplane was registered to Van E Aviation LLC and operated by Integrated Flight Resources, Inc., under Title 14 *Code of Federal Regulations* Part 91 as a positioning flight on an instrument flight rules flight plan. The flight originated from DuPage Airport (DPA), West Chicago, Illinois, at 0622 and was destined to MGC for a Part 135 on-demand passenger flight. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Division for evaluation.

2. GROUP

A 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: **147421**

3.1 CVR Carriage Requirements

Per federal regulation, multiengine turbine aircraft with more than six passenger seats and requiring two pilots manufactured prior to April 7, 2010, and operated under Part 91, must be equipped with a CVR that records a minimum of the last 30 minutes of aircraft operation; this is accomplished by recording over the oldest audio data. The accident aircraft was manufactured in 2002. When the CVR is deactivated or removed from the

airplane, it retains only the most recent 30 minutes or 2 hours of CVR operation depending on the CVR model.

3.2 Recorder Description

This model CVR, the L-3/Fairchild FA2100-1020, 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 4-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 panels sources and a second channel that contains the cockpit area microphone (CAM) source. The 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.

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 Description

Each channel's audio quality is indicated in Table 1.¹ Channel number three did not contain any audio information, nor was it required by federal regulations.

Table 1. Audio Contents and Quality.

Channel Number	Content/Source	Quality	Duration
1	Combined Crew	Excellent	120 min
2	CAM	Good	120 min
3	N/A	N/A	30 min
4	Pilot monitoring	Excellent	30 min
5	Pilot flying	Excellent	30 min
6	CAM	Good	30 min

3.5 Timing and Correlation

Timing on the partial transcript was established using the time of the accident, as supplied by the Investigator-In-Charge. The relative time of the CVR audio events were offset to reflect the local central standard time of the accident.

3.6 Description of Audio Events

In agreement with the Investigator-In-Charge, a CVR group did not convene. Table 2 includes a summary of events from the CVR.

Table 2. CVR events from accident flight.

Time (CST)	Event
06:19:32	start of recording
06:20:54	N525KT received clearance to Michigan City Airport
06:21:44	N525KT cleared to taxi to runway two left
06:23:19	crew completes taxi checklist

¹ See attached CVR Quality Rating Scale.

Time (CST)	Event
06:25:52	N525KT cleared for takeoff
06:26:39	crew completed before takeoff checklist
06:27:05	N525KT lifted off
06:34:09	crew received garbled AWOS report from Michigan City Airport and discussed shooting GPS approach to runway two zero. they mentioned previous observation including light snow.
06:34:57	partial AWOS report from Michigan City Airport indicated broken cloud cover at 1000 feet, 1900 feet overcast, temperature -13°C, dewpoint -16°C, and altimeter 30.65 inches Hg
06:36:06	crew received partial AWOS report from Michigan City indicated winds were out of 230 degrees at 8 knots with 2 miles visibility.
06:36:44	crew briefed step down altitudes for the GPS approach to runway two zero at Michigan City
06:37:42	South Bend Approach cleared N525KT to join the RNAV runway two zero approach at Michigan City and noted the PAPI was out of service
06:43:09	crew discussed using engine and wing anti-ice before descending into clouds
06:43:31	N525KT cleared to descend to 3000 feet
06:43:57	N525KT cleared for the RNAV approach to runway two zero at Michigan City
06:45:46	N525KT reported eight miles out on the CTAF
06:45:53	crew extended approach flaps
06:46:08	crew extended landing gear
06:46:48	crew noted reference speed was about 107 or 108 knots.
06:47:22	N525KT reported four and a half mile final for runway two zero on CTAF
06:48:12	pilot flying reported runway in sight and called for full flaps
06:48:26	N525KT reported two mile final for runway two zero on CTAF
06:48:35	pilot monitoring noted aircraft was at reference speed
06:48:43	500 foot automated callout
06:48:55	pilot monitoring noted "plus five"
06:49:18	pilot flying reported they had a snowy runway
06:49:33	pilot monitoring called, "ground flaps"
06:49:33	sound similar to landing gear touchdown
06:49:37	pilot flying noted he was braking "real hard"
06:49:47	pilot monitoring called, "go go," followed by sound of engine rpm increasing
06:50:00	sounds of impact
06:50:25	end of recording

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.