

**NATIONAL TRANSPORTATION SAFETY BOARD**  
Vehicle Recorder Division  
Washington, DC 20594

December 30, 2013

## **Cockpit Voice Recorder**

**Specialist's Factual Report**  
**By Bill Tuccio, Ph.D.**

### **1. EVENT**

Location: Cincinnati, Ohio  
Date: June 18, 2013  
Aircraft: Israel Aerospace Industries 1124 (WestWind), N112EM  
Operator: E. Micah Aviation Incorporated  
NTSB Number: CEN13LA366

### **2. GROUP**

A group was not convened.

### **3. SUMMARY**

On June 18, 2013, about 1125 eastern daylight time (EDT), an Israel Aircraft Industries 1124 (Westwind) airplane, N112EM, was substantially damaged during landing at Cincinnati Municipal Airport (KLUK), Cincinnati, Ohio. The flight instructor, pilot, and passenger did not report any injuries. The airplane was registered to and operated by E. Micah Aviation Incorporated under the provisions of 14 *Code of Federal Regulations Part 91* as an instructional flight. Day visual meteorological conditions prevailed and no flight plan was filed. The local flight departed KLUK about 1045. A tape cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout.

### **4. DETAILS OF INVESTIGATION**

The NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **Fairchild A-100A**  
Recorder Serial Number: **56771**

#### **4.1. Recorder Description**

Per federal regulation 14 CFR 91.609, aircraft manufactured prior to April 7, 2010, 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. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes of CVR operation. This model CVR, the Fairchild A-100A, records 30 minutes of analog audio on a continuous loop tape in a four-channel format: one channel for each flight crew and one channel for the cockpit area microphone (CAM).

#### **4.2. Recorder Damage**

Upon arrival at the audio 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.

#### **4.3. CVR Channels**

The recording consisted of four channels of audio information. Two of the channels contained audio information from the captain's and first officer's audio panels. The quality of these two channels was good.<sup>1</sup> One channel contained the cockpit area microphone (CAM) audio information. The quality of this channel was good. The fourth channel did not contain audio, nor was it required by law to do so.

#### **4.4. Timing and Correlation**

The times used in this report are expressed as local time of the accident (EDT).

Timing of the transcript was aligned with the local accident time as provided by the Investigator-in-Charge as 1125 EDT. The accident time was aligned with the sound similar to touchdown recorded on the CVR at 0030:20 CVR Elapsed Time (time from the start of the recording). Accordingly, 1054:40 was added to CVR Elapsed Time to convert to EDT.

#### **4.5. Summary of Recording Contents**

In agreement with the Investigator-In-Charge, a CVR group did not convene and only this summary report was prepared.

The recording began at about 1055 EDT, when the cockpit discourse indicated the aircraft was above 10,000 feet conducting flight training. Instructional topics included steep turns and stalls. The student was the flying pilot.

At about 1110 EDT, the student pilot briefed an instrument approach to runway 21L at KLUK. The instructor critiqued the crew briefing and suggested additional areas of emphasis.

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<sup>1</sup> See Attachment I for the CVR Quality Rating Scale

Air traffic control (ATC) vectored the aircraft for the ILS runway 21L at KLUK. During the vectoring, the instructor pilot requested two ILS approaches and was given missed approach instructions.

At 1118:42 EDT, the student pilot requested flaps 12. Shortly thereafter, ATC instructed the aircraft to descend to 2,500 feet.

At 1120:12 EDT, the instructor prompted the student to call for the landing checklist.

At 1120:40 EDT, ATC cleared the aircraft for the ILS 21L. The instructor pilot acknowledged the approach clearance, called out flaps 20, and then set flaps 20. Both pilots then confirmed vRef was 127 knots.

At 1121:28 EDT, the instructor contacted KLUK tower and requested the option<sup>2</sup> for landing. The student acknowledged the aircraft was cleared for the option.

At 1122:30 EDT, the student called for gear down. The instructor acknowledged the request followed by a sound similar to gear extension. The instructor then provided further instruction to the student on how to fly the approach.

At 1122:42 EDT, the instructor noted full flaps were set and the landing checklist was completed. The student acknowledged the gear was down. The instructor then confirmed the landing checklist was complete and instructed the student to “fly the airplane.” At about this time, the CVR began to record a cyclical, faint, high pitch tone, similar to the engine igniters; this sound continued through the landing.

At 1123:01 EDT, the instructor prompted the student to fly vRef plus 10 and then said this was 137 knots. The instructor then confirmed with KLUK tower that the aircraft was cleared for the option on runway 21L.

At 1123:24 EDT, the instructor prompted the student to fly vRef and then said this was 127 knots. The instructor then provided instruction on how the student should control glidepath and airspeed with “v-bars” and power, respectively.

At 1124:09 EDT, the instructor called out a hundred feet to go.

At 1124:10 EDT, an automated voice called out “five hundred.” The instructor and student briefly discussed the minimums for the approach.

At 1124:19 EDT, the instructor verified the student had the runway in sight. The student confirmed. The instructor continued to provide instruction and corrections to the student.

At 1124:34 EDT, the instructor said, “take er down. about fifty foot above the terrain you gonna close your throttles and just take her in [unintelligible]<sup>3</sup> just take her right on down.”

At 1124:43 EDT, the instructor said, “right on down. don't get in no hurry to get her on the ground. take her down. and power coming off. a little bit too high now. hold up there. trim while your waiting. trim. trim. trim. trim. hold it. trim. trim. hold it. trim. trim.”

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<sup>2</sup> The “option” permits a pilot the option to make a touch-and-go, low approach, missed approach, stop-and-go, or full stop landing (Airman’s Information Manual).

<sup>3</sup> The [bracketed] text is an editorial comment added added for the benefit of the reader.

At 1124:53 EDT, a high pitch tone (about 2000Hz), similar to the trim warning buzzer, sounded for 8.5 seconds.

At 1125:00 EDT, the instructor said, "no no no we're not stopping." As the instructor was making this statement, a half-second rumbling sound was recorded. As the rumbling sound ended, the 2000Hz tone ended.

At 1125:01 EDT, the student said, "okay my bad."

At 1125:01.5 EDT, a steady, mid-level tone (about 1400Hz), similar to the gear warning horn, began and continued until the end of the recording.

At 1125:02 EDT, the instructor began to swear, which continued periodically until the end of the recording.

At 1125:03 EDT, the sound of a thunk followed by 1.3 seconds of scraping was recorded.

At 1125:07 EDT, the distinct sound of scraping began and continued for 20 seconds. The background sound and scraping decreased in intensity over the 20-second period, similar to the aircraft decelerating.

At 1125:32 EDT, when the aircraft had come to a stop, the instructor said, "that right gear collapsed on this son of a [expletive]. get out."

The instructor then directed the occupants to evacuate the aircraft. One of the occupants commented the left engine was still running. The instructor responded he could not shut "it" off.

At 1126:37 EDT, power was interrupted to the CVR.

At an unknown time, power was briefly applied to the CVR recording unintelligible voices. The recording ended about 30 seconds later.

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Vehicle Recorder Division

## 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.