

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

April 3, 2019

Cockpit Voice Recorder

Specialist's Factual Report
By Christopher Babcock

1. EVENT SUMMARY

Location: Kake, Alaska
Date: January 29, 2019
Aircraft: Hawker Beechcraft B200 Super King Air, Registration N13LY
Operator: Guardian Flight LLC
NTSB Number: ANC19FA012

On January 29, 2019, about 1811 Alaska standard time, a twin-engine, turbine-powered Textron Aviation (formerly Beech Aircraft Corporation) B200 Super King Air airplane, registration N13LY, was destroyed after impacting the waters of Frederick Sound following a loss of control while on approach to Kake Airport (PAFE), Kake, Alaska. The airplane was being operated by Guardian Flight LLC as an instrument flight rules (IFR) air ambulance flight under the provisions of Title 14 *Code of Federal Regulations* Part 91 when the accident occurred. The airline transport pilot, flight paramedic, and flight nurse were fatally injured. Visual meteorological conditions prevailed at the destination airport, and company flight following procedures were in effect. The flight departed Ted Stevens Anchorage International Airport (PANC), Anchorage, Alaska, about 1604 destined for PAFE. 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: **Fairchild A-100S**
Recorder Serial Number: **02796**

3.1 CVR Carriage Requirements

Per federal regulation, turbine multiengine aircraft with six or more passenger seats and requiring two pilots manufactured prior to April 7, 2010, and operated under Part 91 or 135, 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 2000 but required only one pilot. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes.

3.2 Recorder Description

This model CVR, the Fairchild A-100S, records a minimum of 30 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).

3.3 Recorder Damage

Upon arrival at the laboratory, the recorder was submerged in distilled water. The recorder exhibited impact damage (Figure 1). The recorder was opened, and the crash protected memory unit was extracted and thoroughly rinsed and soaked in deionized water to more effectively remove salt deposits on the unit (Figure 2). After soaking, the unit was dried in a vacuum oven.



Figure 1. Condition of CVR, as received.

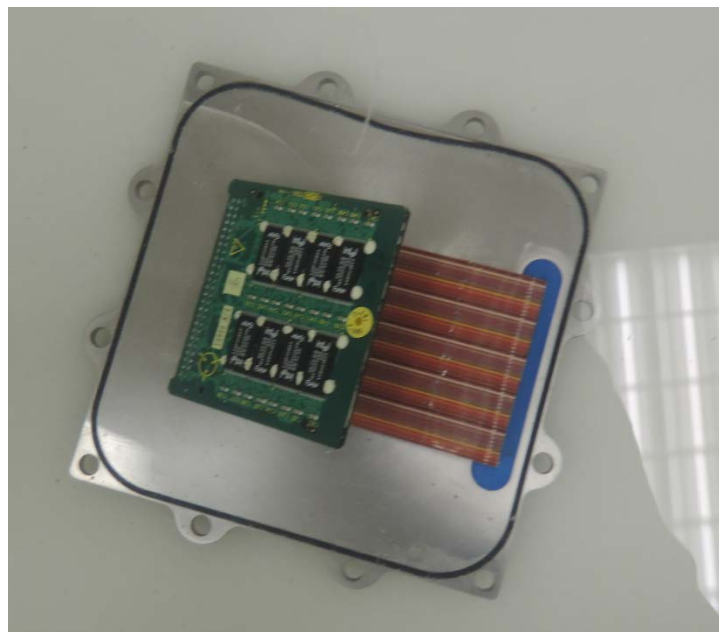


Figure 2. Memory board soaking in deionized water.

The first attempt to download the audio using the manufacturer's procedures and a laboratory surrogate recorder were not successful. Removal of the connector connecting the ribbon cable and memory board revealed substantial corrosion (Figure 3) causing the solder joints to degrade. The memory board was cleaned, and a new connector was soldered in place and connected to the ribbon cable. The connector on the other end of the ribbon cable was replaced as well (Figure 4). The second attempt to download the audio was successful.

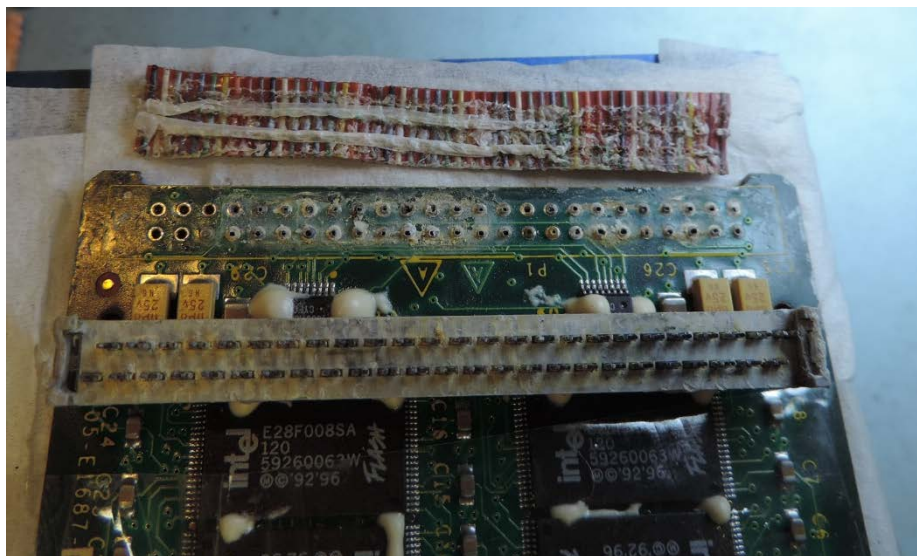


Figure 3. Corrosion found under connector.

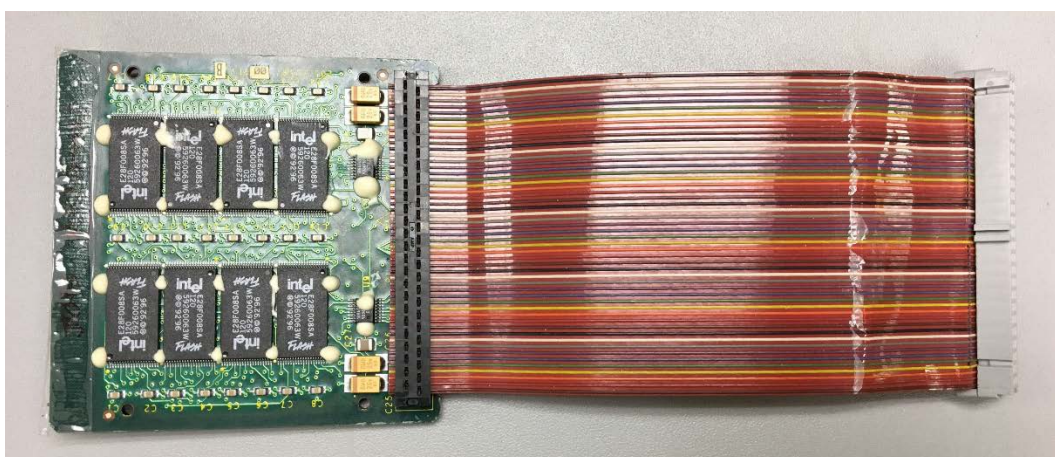


Figure 4. Repaired memory board and connectors.

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).

¹ See attached CVR Quality Rating Scale.

Table 1. Audio Quality.

| Channel Number | Content/Source | Quality | Duration (mm:ss) |
|----------------|------------------------|-----------|------------------|
| 1 | Pilot Audio Panel | Excellent | 30:24 |
| 2 | Right Seat Audio Panel | Excellent | 30:24 |
| 3 | N/A | N/A | 30:24 |
| 4 | CAM | Good | 30:24 |

The audio recorded on the CVR did not contain the accident flight. The audio contained a normal approach, landing, taxi, and shutdown at Fort Yukon Airport, Fort Yukon, AK. After the shutdown, the aircraft was powered up and the pilot requested and received an IFR clearance to Fairbanks, AK. The recorder stopped recording as the aircraft taxied to the runway.

3.5 Timing and Correlation

During the flight to Fort Yukon, a radio broadcast from an ESPN radio affiliate was received and recorded on channel 1 of the CVR. The broadcast contained a halftime report of game 6 of an NBA playoff series between Golden State and Memphis. The report indicated that Golden State was leading at halftime 58-49. A review of NBA playoff history indicated that the only occurrence of an NBA playoff game 6 where Golden State was leading Memphis at halftime 58-49 was on May 15, 2015 (Figure 5).

WESTERN CONFERENCE SEMIFINALS - GAME 6, GS wins series 4-2

Golden State Warriors

67-15, 28-13 Away



108

| | 1 | 2 | 3 | 4 | T |
|-----|----|----|----|----|-----|
| GS | 32 | 26 | 18 | 32 | 108 |
| MEM | 19 | 30 | 19 | 27 | 95 |

95



Memphis Grizzlies

55-27, 31-10 Home

Figure 5. 2015 NBA Western Conference Semifinal game 6 box score.²

² <http://www.espn.com/nba/game?gameId=400792893>, accessed April 3, 2019

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. |