

**NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Vehicle Recorder Division
Washington, D.C. 20594**



SPECIALIST'S FACTUAL REPORT OF INVESTIGATION

WPR22LA039

**By
Michael Portman**

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 a Safety Board investigative effort. The summary or parts thereof, if taken out of context, could be misleading. The summary should be viewed as an 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

March 21, 2022

Cockpit Voice Recorder

Specialist's Factual Report
By Michael Portman

1. EVENT SUMMARY

Location: North Las Vegas, Nevada
Date: November 14, 2021
Aircraft: Israel Aerospace Industries 1125
Registration: N771DX
Owner: EMD Astra
NTSB Number: WPR22LA039

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following tape cockpit voice recorder (CVR):

Recorder Manufacturer/Model: **Fairchild A-100A**
Recorder Serial Number: **57665**

3.1 CVR Carriage Requirements

Per federal regulation, multiengine aircraft with more than six passenger seats and requiring two pilots manufactured prior to April 7, 2010, and operated under 14 *Code of Federal Regulations* (CFR) 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 event aircraft was manufactured in 1995. 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-100A, records a minimum of 30 minutes of analog audio on a continuous loop tape in a four-channel format: 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, an examination was conducted, and the unit was disassembled to retrieve the enclosed magnetic tape recording medium. External examination did not reveal any readily apparent damage, as seen in figure 1.



Figure 1. External of the CVR, as received.

Upon extracting and opening the crash survivable memory unit (CSMU), it was noted that the bulk erase electromagnet's casing had melted, which then coated portions of the magnetic tape and the recording mechanism, as seen in figure 2.

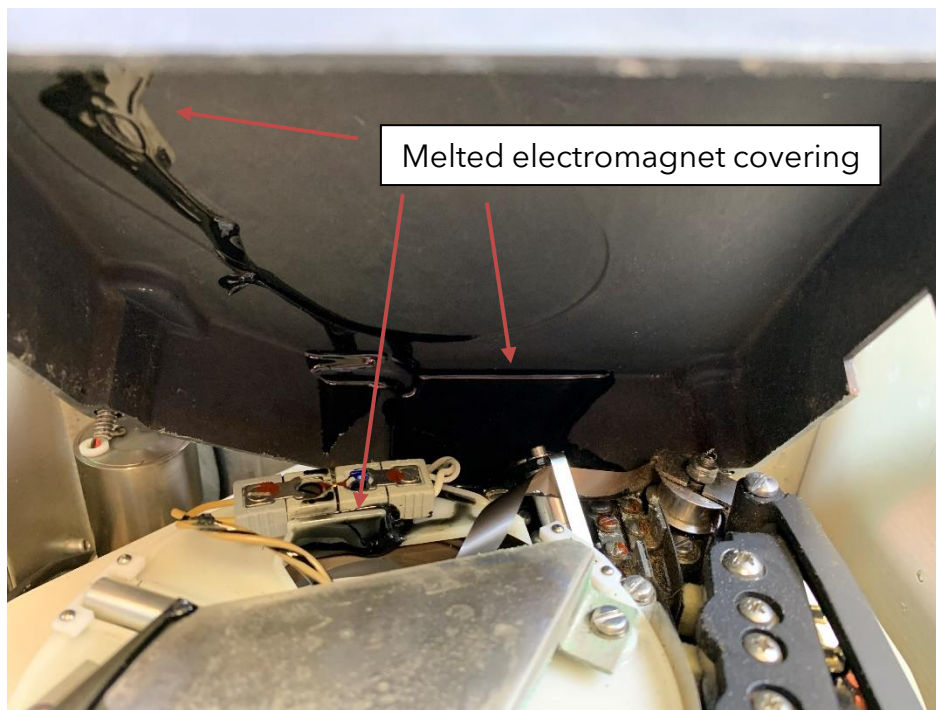


Figure 2. Inside of the crash case, showing the melted electromagnet covering.

The tape itself was noted to have several folds in its main winding, as highlighted in red circles in figure 3.

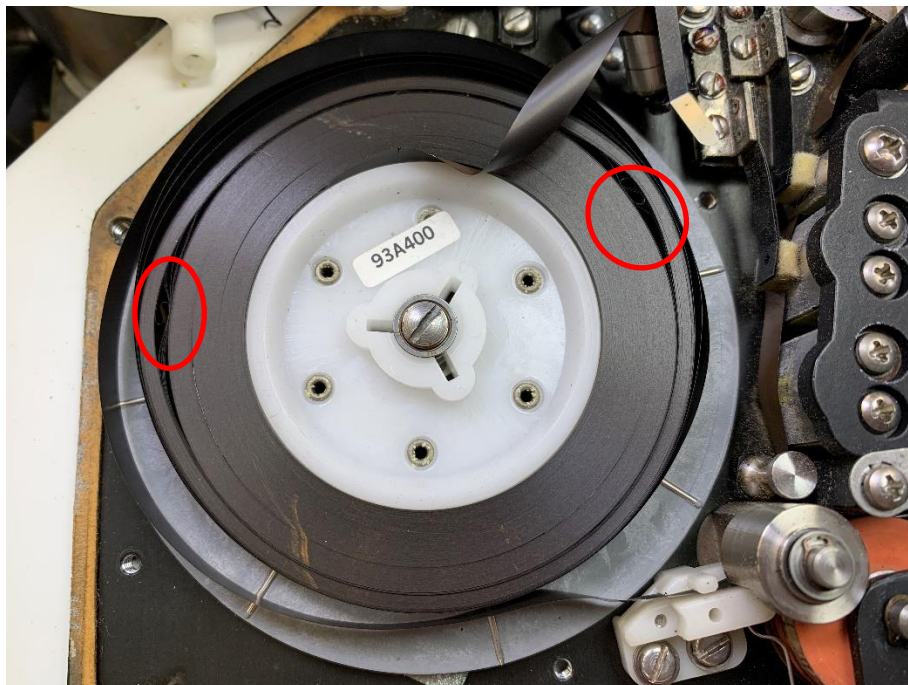


Figure 3. The magnetic tape spool, showing instances of tape folding.

The magnetic tape was then recovered from the CSMU. Examination of the extricated tape revealed that it had been bunched in the recording heads in an accordion shape, as seen on the left of figure 4.



Figure 4. The magnetic tape, liberated from the recording mechanism, showing operational damage.

The tape was treated using laboratory techniques, including removing small portions of the tape that had been covered in the melted electromagnet covering. The tape was then read out. Approximately 34 minutes of data were recovered, with the remaining small amount of data unrecoverable due to tape damage.

3.4 Audio Recording Description

The recording consisted of four channels of audio information, however, none of the audio was pertinent to the incident investigation. The audio was consistent with the CVR having failed in operation prior to the incident and thus recording previous, unrelated events. Characteristics of this type of recording include:

- Audio consistent with the airplane being stationary on the ground with electrical power on.
- Conversations or other audio consistent with maintenance personnel working in or near the cockpit.
- Conversations or other audio indicating the airplane is taxiing.
- Background sounds in an unoccupied cockpit such as:
 - Radio transmission from other aircraft or ground facilities.
 - Unintelligible or difficult to discern conversation or other sounds likely emanating from the cabin or outside the airplane.