

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, DC 20594

November 28, 2012

Cockpit Voice Recorder

Specialist's Factual Report

By Bill Tuccio

1. EVENT

Location: Houston, Texas
Date: March 4, 2011, 0400 Central Standard Time (CST)
Aircraft: Learjet 25D, XA-TWH
Operator: Personas y Paquetes Por Aire, S.A. de C.V.
NTSB Number: CEN11LA223

2. GROUP

A group was not convened.

3. SUMMARY

On March 4, 2011, at approximately 0400 central standard time, a Learjet 25D, XA-TWH, had a runway excursion and impacted obstructions during landing at the William P. Hobby Airport (KHOU) in Houston, Texas. The two pilots, two medical crewmembers, and two passengers were not injured. The airplane was operated by a foreign air carrier as an air ambulance flight. Low instrument meteorological conditions prevailed and an instrument flight rules flight plan was filed. The flight originated from the Llano San Juan Airport (MMTG), Tuxtla Gutiérrez, Chiapas, México. During the landing, the airplane struck and damaged runway end lights and the localizer antenna system. The lower forward portion of the fuselage sustained substantial damage. A tape cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout.

4. DETAILS OF INVESTIGATION

On March 25, 2011, the NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **B&D Instruments and Avionics**
Recorder Serial Number: **84105**

4.1. Recorder Description

Per federal regulation, 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 B&D Instruments and Avionics, records 30 minutes of analog audio on a continuous loop tape in a four-channel format: one channel for each flight crew, one channel for the observer, 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. However, upon inspection of the tape inside the undamaged, protected housing, it was evident the tape mechanism was damaged. Photos 1 through 7 show the damage evidenced during disassembly. In particular, photo 4 and 6 show tangling of the tape on a feeder spool. Despite the damaged tape assembly, it was possible to recover audio from the extracted tape shown in Photo 7.



PHOTO 1

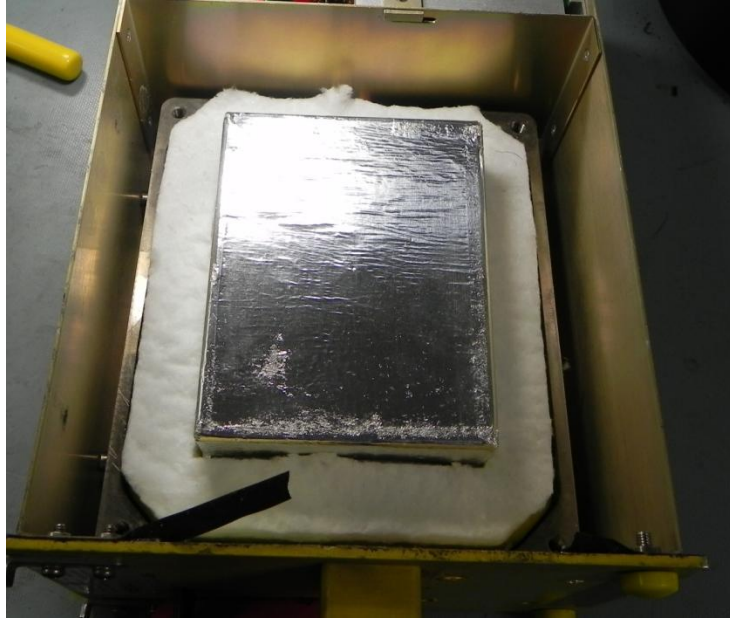


PHOTO 2

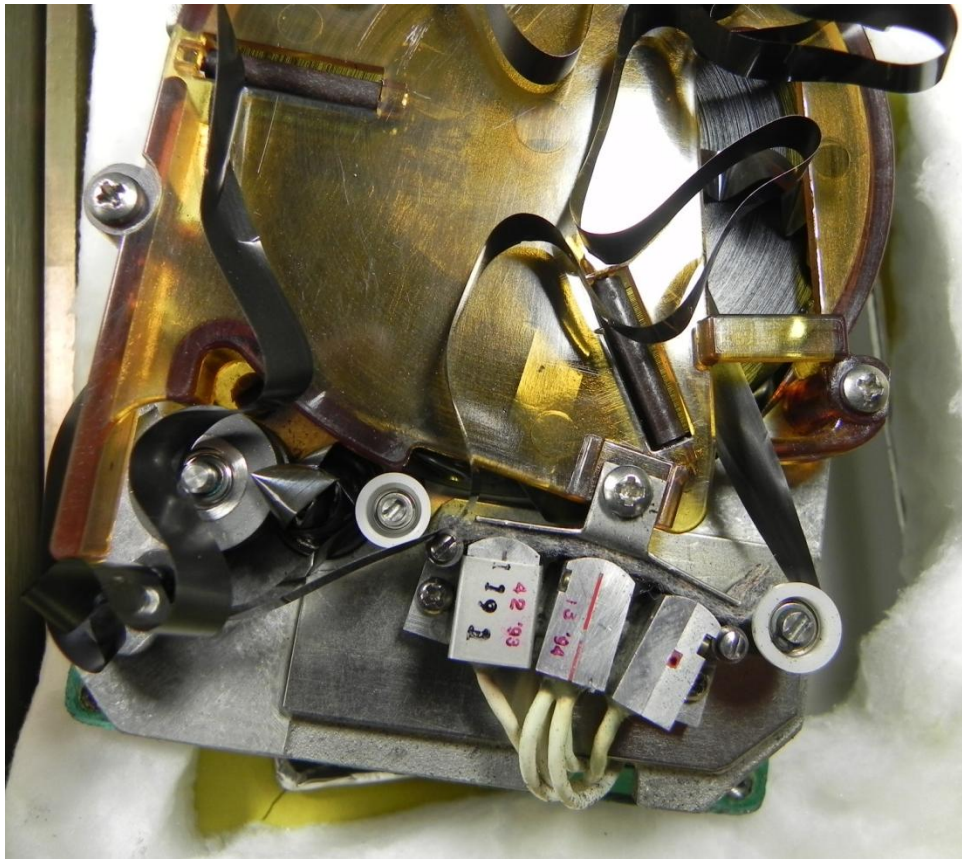


PHOTO 3



PHOTO 4



PHOTO 5



PHOTO 6

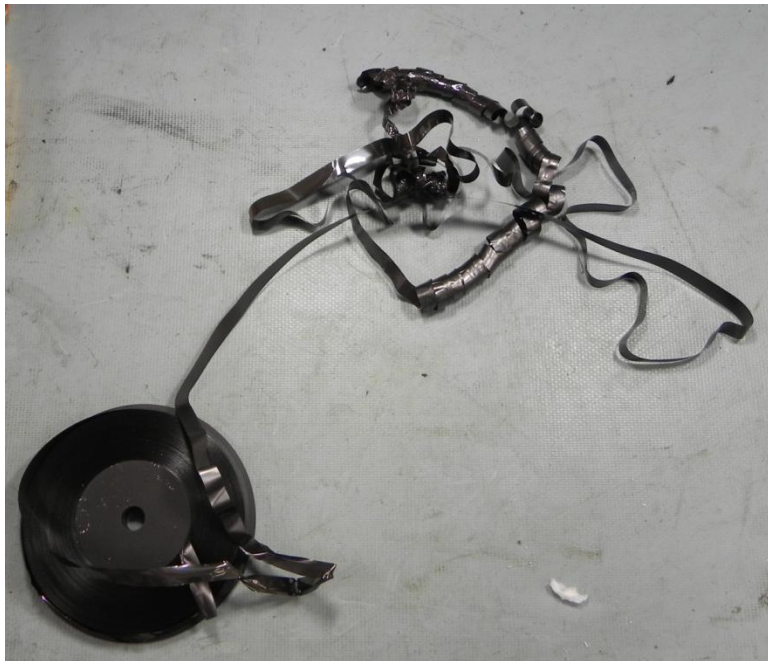


PHOTO 7

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.¹ One channel contained the cockpit area microphone (CAM) audio information. The quality of this channel was good. The fourth channel contained observer panel audio and the quality was good.

4.4. Summary of Recording Contents

The CVR recorded the enroute portion of a flight, with voices spoken in Spanish and English. The recording ended during an enroute descent. Other radio traffic recorded on the CVR indicated the contents of the CVR was not that of the accident flight.

Bill Tuccio
Vehicle Recorder Division

¹ See Attachment I for the CVR Quality Rating Scale

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.