

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

October 10, 2017

Lightweight Data Recorder & Onboard Image Recorder

Specialist's Factual Report
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1. EVENT SUMMARY

Location: Jupiter, Florida
Date: August 03, 2017
Aircraft: Sikorsky S-97A, N971SK
Operator: Sikorsky
NTSB Number: ERA17LA263

For a description of this accident, see the other investigative documents.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following devices:

Recorder Manufacturer/Model:	L-3 Lightweight Data Recorder (LDR)
Recorder Serial Number:	000948759
Recorder Manufacturer/Model:	SD Card (from GoPro camera)
Recorder Serial Number:	Not applicable

3.1 Flight Recorder Carriage Requirements

This particular aircraft, N971SK, was operating as an experimental aircraft and was not required to carry a flight recorder. The NTSB inquired how the S-97A model aircraft would be operated when certified (that is, aircraft developed based upon tests conducted by experimental/developmental S-97A aircraft), as it pertains to cockpit voice and flight data recorder carriage requirements (such as, weight, number of passengers, crew, etc.), and the operator said this model aircraft will not be certified.

3.2 LDR Description

The L-3 LDR is a crash protected audio, video, and GPS flight recorder intended for General Aviation (GA) use, qualified to FAA Technical Standard Order TSO-C197. Storage capacity depends upon configuration of supported recording functions.

3.2.1 LDR Damage and Recovery

Upon arrival at the laboratory, it was evident that the LDR had not sustained any heat or structural damage. Download of the device was attempted using the procedures outlined in L-3's LDR manual, part number 165E4866-00 (revision 12) and a proprietary 50-pin D-sub connector cable. The initial download attempt was unsuccessful because the download computer was unable to connect to the LDR using the default TCP/IP address. Sikorsky indicated they changed the default IP address so the LDR could operate on the aircraft's internal network. The unit-configured TCP/IP address was obtained from Sikorsky and the LDR information was downloaded without further difficulty.

3.2.2 LDR Recording Description

The LDR was configured to only record audio data. Only audio data on one channel was recovered, and this channel was consistent as being recorded by a cockpit area microphone. The quality of the recording was good with engines off and poor to unusable with engines operating.¹

The accident event was not captured. The recorded content was consistent with activities at an unknown time prior to the accident.

3.3 SD Card (from GoPro Camera) Description

The GoPro camera is a point-of-view camera capable of high-definition video and audio recording. Content is recorded to a removable SD card.

3.3.1 SD Card (from GoPro Camera) Recovery

Files on the SD card were reviewed and the accident event was identified.

3.3.2 SD Card (from GoPro Camera) Description

The accident event recording contained high-definition video and ambient audio. The camera was mounted behind the two pilots looking forward.

Information captured by the camera was consistent with investigative interviews of the surviving crew. In agreement with the IIC, there was no need to summarize further details from the recording.

¹ See attached 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.