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

GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

CEN11FA144

By
Bill Tuccio

WARNING

The reader of this report is cautioned that the transcription of a cockpit voice recorder audio recording is not a precise science but is the best product possible from a Safety Board group investigative effort. The transcript or parts thereof, if taken out of context, could be misleading. The transcript should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the transcript as the sole source of information.

NATIONAL TRANSPORTATION SAFETY BOARD
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March 22, 2011

Cockpit Voice Recorder - 12

Group Chairman's Factual Report
By Bill Tuccio

A. EVENT

Location:	Springfield, Illinois
Date:	January 6, 2011, 11:00 central standard time (CST)*
Aircraft:	Lear 35A, N800GP
Operator:	Priester Aviation, Flight Priester 800
NTSB Number:	CEN11FA144

B. GROUP

A group was convened on February 8, 2011.

Chairman:	Bill Tuccio National Transportation Safety Board
Member:	Tim Sorensen Investigator in Charge National Transportation Safety Board
Member:	T.R. Proven Air Safety Investigator Federal Aviation Administration
Member:	Sebastian Fedko Pilot Priester Aviation
Member:	Gary Spears Senior Test Pilot Bombardier Learjet

* All times are expressed in CST, unless otherwise noted.

C. SUMMARY

On January 6, 2011, about 11:00 CST, a Learjet 35A, N800GP, was substantially damaged during a hard landing and runway excursion on Runway 22 at Abraham Lincoln Capitol Airport (SPI), Springfield, Illinois. The flight was being conducted under 14 Code of Federal Regulations Part 135 as flight Priester 800 on an instrument flight rules (IFR) flight plan. Instrument meteorological conditions were encountered during the instrument landing system (ILS) approach. Visual meteorological conditions prevailed on the airport at the time of the accident. The captain sustained minor injuries. The first officer and all four passengers on-board were not injured. The flight departed Chicago Midway International Airport (MDW), Chicago, Illinois, at 10:34. The intended destination was SPI. A tape cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout. The CVR group meeting convened on February 8, 2011 and a partial transcript was prepared for the final 16 minutes 45 seconds of the 30 minute 48 second tape recording (see attached).

D. DETAILS OF INVESTIGATION

On January 24, 2011, the NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **Fairchild Model GA-100**
Recorder Serial Number: **00684**

Recorder Description

Per Federal regulation, CVRs record 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 Model GA-100, 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).

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.

Audio Recording Description

The 30 minute 48 second recording consisted of three channels of useable audio information. Each channel's audio quality[†] is indicated in the table. Notably, channel number four did not contain any audio information (nor was it required by Federal regulations).

[†] See attached CVR Quality Rating Scale.

Channel Number	Content/Source	Quality
1	Captain	Excellent
2	First Officer	Excellent
3	CAM	Good
4	N/A	N/A

Timing and Correlation

Timing on the transcript was established by correlating the air traffic control recording transmission time to the corresponding CVR event. Specifically, a Priester 800 radio transmission recorded by Springfield Airport Traffic Control Tower (ATCT) at 16:52:26 UTC corresponded to a CVR elapsed time of 00:22:01.830. Subtracting 6 hours from the ATCT 16:52:26 UTC time, results in 10:52:26 CST. All CVR events were offset to reflect local CST by adding 10:30:24.170 to CVR elapsed time. A linear regression was performed using six other times (16:52:55, 16:53:06, 16:53:12, 16:53:22, 16:55:05, 16:57:21) and the resulting correlation coefficient of 1.0 confirmed linearity.

Description of Audio Events

The recording began at 10:30:24 as the crew was taxing for departure at Chicago Midway International Airport. The captain decided to use 20 degrees of flaps for the runway 31R departure. The captain noted the runway was 5,100 feet in length, the take-off weight was 14,500 pounds, and the v1 speed would be 106 knots with an additional speed of 126 knots. Throughout the recording, the captain can be heard making sounds similar to clearing of throat and nasal passages.

After an uneventful taxi out, the aircraft departed runway 31R at 10:33:18 with the first officer as the flying pilot. After departure the aircraft climbed to 16,000 feet after executing a series of air traffic control (ATC) required intermediate level offs. The captain reported to ATC only trace icing in the climb. Crew conversations at 16,000 feet indicated the aircraft was operating above a cloud layer, in visual conditions.

The remainder of the flight is described by the attached transcript. The recording ended at 11:01:20.

As part of the Safety Board's accident investigation process, the flight crew was invited to review the CVR transcript and suggest corrections or additions. The crew declined the invitation.

Bill Tuccio
Aerospace Engineer
Vehicle Recorder Division

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.

Transcript of a Fairchild Model GA-100 tape cockpit voice recorder, serial number 00684, installed on an Priester Aviation Lear 35A (N800GP), which crashed after a hard landing and subsequent runway excursion at Abraham Lincoln Capital Airport in Springfield, Illinois.

LEGEND

CAM	Cockpit area microphone voice or sound source
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from N800GP
CTR	Radio transmission from center controller
APR	Radio transmission from the Springfield approach controller
TWR	Radio transmission from the Springfield airport tower controller
ATIS	Radio transmission from Springfield Automatic Terminal Information Service
GPWS	Ground Proximity Warning System
-1	Voice identified as the captain
-2	Voice identified as the first officer
*****	Unintelligible word
#	Expletive
@	Non-pertinent word
( )	Questionable insertion
[ ]	Editorial insertion

Note 1: Times are expressed in central standard time (CST).

Note 2: Generally, only radio transmissions to and from the accident aircraft were transcribed.

Note 3: Words shown with excess vowels, letters, or drawn out syllables are a phonetic representation of the words as spoken.

Note 4: A non-pertinent word, where noted, refers to a word not directly related to the operation, control or condition of the aircraft.

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:30:24.2 **START OF RECORDING**			
10:44:30.1 **START OF TRANSCRIPT**			
		10:44:30.1 **ATIS-1**	point niner for clearance V-F-R say on course heading in-- requested altitude advise on initial contact you have Quebec...Springfield tower information Quebec one five five two zulu wind three two zero at one two visibility niner ceiling one thousand five hundred overcast temperature minus two dewpoint minus six alitimeter two niner eight zero I-L-S runway two two approach I-L-S runway three one approach in use notice to airmen arrivals use frequency one two six point one five departure contact ground control on one two one point niner for clearance V-F-R say on course heading in degrees requested altitude advise on initial contact you have Quebec
10:44:30.9 **HOT-2**	*** I guess one's quiet		
10:46:02.1 **HOT-1**	three two zero at twelve nine fifteen hundred over		
10:46:06.1 **HOT-2**	I-L-S two two?		
10:46:07.2 **HOT-1**	and one three (oh) three one we don't know yet		
10:46:11.1 **HOT-2**	we'll take two two I mean we's basically headed right towards it		
10:46:24.8 **HOT-1**	[sound similar to paper rustling]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:46:31.6 **HOT-1**	why don't you stick that on top of there		
		10:47:02.7 **CTR**	Priester eight hundred contact chicago center on one one niner point two two
		10:47:07.0 **RDO-1**	nineteen twenty two Priester eight hundred see ya
		10:47:23.7 **RDO-1**	ah Priester eight hundred with you one six thousand
		10:47:28.5 **CTR**	Priester eight hundred Chicago Center cross ah two zero miles north of Spinner at and maintain one one thousand Bloomington alitimeter two niner seven three
		10:47:36.3 **RDO-1**	twenty north at one one thousand Priester eight hundred
10:47:36.4 **HOT-2**	[sound of high frequency tone]		
10:47:43.4 **HOT-2**	*		
10:47:45.4 **HOT-2**	five thousand... for fifteen miles...thirty five miles or forty miles		
10:48:01.3 **HOT-1**	yep...forty miles		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:48:32.1 **HOT-2**	this is cool right at the tops doing three hundred and fifty knots		
10:48:36.0 **HOT-1**	yep		
10:48:56.9 **HOT-2**	yeh like I was like sometimes I look down in the cockpit on takeoff it's just cause it's a habit to see the pilot but I had myself focus outside cause when necessarily spread out I—		
10:49:07.5 **HOT-1**	yeh		
10:49:24.6 **HOT-1**	[sound similar to overspeed warning]		
10:50:34.3 **HOT-2**	(ah well) we'll start down		
		10:50:36.9 **RDO-1**	Priester eight hundred vacating one six thousand
10:50:40.9 **HOT-1**	*		
10:50:43.2 **HOT-2**	twenty nine eighty		
10:50:45.2 **HOT-1**	yeh he gave us seventy three but that's the field so		
10:50:48.7 **HOT-1**	[sound similar to decrease in engine noise]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:51:28.0 **HOT-1**	[sound similar to slight increase in engine noise]		
10:52:06.3 **HOT-1**	windshield heat		
10:52:09.5 **HOT-1**	pressurization is checked		
10:52:11.2 **HOT-1**	[sound similar to gear warning horn]		
		10:52:12.4 **CTR**	* contact Springfield approach on one two six point one five
		10:52:16.9 **RDO-1**	twenty six fifteen Priester eight hundred see ya
10:52:19.3 **HOT-2**	heats are on		
10:52:20.7 **HOT-1**	good deal		
		10:52:26.0 **RDO-1**	ah Springfield it's Priester eight hundred with you out of thirteen for eleven Quebec down at the airport for Landmark good morning
10:52:47.0 **HOT-1**	[sound similar to open squelch]		
10:52:50.5 **HOT-1**	twenty six fifteen right		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:52:51.9 **HOT-1**	[sound similar to open squelch]		
		10:52:55.4 **APR**	Priester eight zero zero Springfield approach descend and maintain ah three thousand one hundred expect vectors to I-L-S runway three one final approach course verify information Quebec
		10:53:06.5 **RDO-1**	three thousand one hundred information Quebec affirmative ah Priester eight hundred
10:53:10.6 **HOT-2**	ask him if we can get two two		
		10:53:12.1 **RDO-1**	Priester eight hundred any chance two two
10:53:15.4 **HOT-1**	[sound similar to decrease in engine noise]		
10:53:17.6 **HOT-1**	yeah that's right		
		10:53:22.5 **APR**	Priester eight hundred turn ah fifteen degrees one five degrees left intercept (ah) the ah I-L-S runway two two localizer
		10:53:31.5 **RDO-1**	fifteen left to join two two localizer Priester eight hundred thank you
10:53:38.5 **HOT-1**	one eleven seven two twenty three		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:53:43.1 **HOT-1**	[sound similar to decrease in engine noise]		
10:53:51.2 **HOT-1**	altimeter set two nine eight zero recog light is on pressurization checked...		
		10:53:56.7 **APR**	Priester eight hundred ah PIREP Mooney landed ah one zero ten minutes ago reported the bases at one thousand eight hundred tops four thousand three hundred temperature minus six light rime icing at two thousand six hundred
		10:54:10.2 **RDO-1**	Priester eight hundred copy that thank you very much
10:54:13.0 **HOT-1**	...ah seat belt signs are on and the cabin is secured		
10:54:17.4 **HOT-1**	approach check breakers		
10:54:20.1 **HOT-2**	checked left		
10:54:21.1 **HOT-1**	hydraulic and emergency air checked		
10:54:23.1 **HOT-1**	ah v-ref is going to be five ten fifteen one nineteen one twenty		
10:54:33.3 **HOT-1**	fuel what we got is balanced plenty of it		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:54:38.2 **HOT-1**	approach setup and briefed you've already looked at it we're on it		
10:54:41.9 **HOT-1**	up to before landing		
10:54:45.4 **HOT-1**	[sound similar to open squelch]		
		10:54:47.6 **RDO-1**	Landmark Springfield Learjet eight zero zero golf papa
10:54:50.9 **HOT-1**	[sound similar to open squelch]		
10:55:19.4 **HOT-1**	[sound similar to increase in engine noise]		
10:55:21.5 **HOT-2**	the one thing I don't like about jets is when you pull the power to idle you lose all your heats		
10:55:26.9 **HOT-1**	that's right		
10:55:28.1 **HOT-2**	you know what I'm sayin' like even in the cabin		
10:55:34.8 **HOT-1**	the air powers everything doesn't it		
10:55:37.5 **HOT-2**	yep		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:55:49.7 **HOT-1**	the C-R-J was initially limited—		
		10:55:51.6 **APR**	Priester eight hundred niner miles from LICOL maintain two thousand two hundred till established on the localizer cleared I-L-S runway two two approach
		10:55:58.8 **RDO-1**	two thousand two hundred till established ah cleared I-L-S two two Priester eight hundred
10:56:00.4 **HOT-1**	[sound similar to decrease in engine noise]		
10:56:04.9 **HOT-1**	twenty two hundred you're cleared—		
		10:56:05.9 **APR**	Priester eight hundred advise if you encounter any icing in the descent
		10:56:08.9 **RDO-1**	ah Priester eight hundred wilco just diving into the tops now four thousand one hundred
10:56:11.5 **HOT-1**	[sound similar to engine ignitors continues to end of recording]		
		10:56:13.9 **APR**	Priester eight hundred *
10:56:20.4 **HOT-1**	[sound of two unidentified sounds]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:56:24.2 **HOT-1**	[sound of one unidentified sound]		
10:56:24.5 **HOT-2**	you were limited to what?		
10:56:25.9 **HOT-1**	sixty three percent...with the ice on		
10:56:30.1 **HOT-2**	I have the ice off now		
10:56:31.4 **HOT-1**	tryin' to get down with sixty three percent fan speed in any airplane without the spoilers out it's just was a ridiculous limitation		
10:56:40.4 **HOT-1**	that was a challenging...challenging situation		
10:56:48.3 **HOT-1**	definately light rime now		
10:56:51.7 **HOT-1**	passing thirty five hundred		
10:56:56.1 **HOT-1**	tower's twenty one three		
10:56:58.6 **HOT-2**	come on baby slow down		
10:57:01.5 **HOT-2**	flaps eight		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:57:02.2 **HOT-1**	you got it		
10:57:03.8 **HOT-2**	gear down		
10:57:04.5 **HOT-1**	[sound similar to switch]		
10:57:05.7 **HOT-1**	[sound similar to switch]		
10:57:05.7 **CAM**	[increase in ambient noise similar to landing gear extension]		
10:57:06.5 **HOT-1**	eight degrees indicating		
10:57:14.4 **HOT-1**	if you pull it up...yeah you're good I mean you're still—		
10:57:15.3 **HOT-2**	flaps twenty		
10:57:18.0 **HOT-1**	[sound similar to switch]		
		10:57:18.2 **APR**	Priester eight hundred contact tower one two one point three
		10:57:21.2 **RDO-1**	twenty one three Priester eight hundred just getting a little light rime here between ah about three and four

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:57:21.3 **HOT-1**	[sound similar to increase in engine noise]		
10:57:23.4 **HOT-1**	[sound of tone, similar to altitude alerter]		
		10:57:28.3 **APR**	Priester eight hundred
		10:57:38.9 **TWR**	information Romeo current wind two niner zero at one two gust one seven
		10:57:44.4 **RDO-1**	Priester eight hundred is checkin' on about eight miles or so hello
		10:57:48.4 **TWR**	Priester eight hundred Springfield approach good mornin' sir runway two two cleared to land
		10:57:51.7 **RDO-1**	two two cleared to land Priester eight hundred thank you
10:57:59.7 **HOT-1**	take it down to about eight hundred		
10:58:02.9 **HOT-1**	lots ah room still		
10:58:03.2 **HOT-2**	flaps full		
10:58:04.6 **HOT-1**	full flaps?		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:58:05.7 **HOT-2**	yep		
10:58:06.6 **HOT-1**	[sound similar to click]		
10:58:08.1 **HOT-1**	set...indicating		
10:58:10.8 **HOT-1**	your ah glideslope's comin' and goin'		
10:58:17.1 **HOT-1**	very good ah before landing spoilers retracted flaps are full already gear's down three green no red landing lights are ah on great ignition is on anti-skid is on engine sync is off hydraulic pressure checked...ignition's on autopilot's ah is still doing its thing and yaw damper you know what to do...plus ten		
10:58:26.2 **CAM**	[sound similar to switches]		
10:58:29.6 **CAM**	[sound similar to switch]		
10:58:49.2 **HOT-2**	I have the wings off but the nacs are on		
10:59:14.1 **HOT-1**	runway's in sight		
		10:59:16.8 **RDO-1**	ah base at five miles two thousand one hundred just a trace of rime

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
10:59:17.5 **HOT-1**	[sound of tone, similar to altitude alerter]		
		10:59:21.8 **TWR**	roger
10:59:29.1 **HOT-1**	all right my man...plus a dozen		
10:59:32.6 **HOT-1**	[sound of tone, similar to autopilot disengagement]		
10:59:34.7 **HOT-2**	me and the good Lord are flyin'		
10:59:34.8 **HOT-1**	*		
10:59:36.8 **HOT-1**	[sound of laughter]		
10:59:39.0 **HOT-1**	prayin' to God		
		10:59:43.8 **TWR**	you recall the temperature er the temperature at twenty one hundred
		10:59:47.1 **RDO-1**	ah we're unable to resolve the ah-ah S-A-T we just have rat available
		10:59:52.6 **TWR**	roger

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
11:00:14.5 **HOT-1**	all right plus a dozen		
11:00:17.4 **HOT-1**	[sound similar to three low frequency thumps]		
11:00:20.4 **COMMENT**	[sound similar to manufacturer splice in CVR tape]		
11:00:26.6 **GPWS**	five hundred		
11:00:40.3 **HOT-1**	plus five		
11:00:42.3 **HOT-1**	ref		
11:00:47.8 **HOT-1**	all right you are all done I'll get your boards		
11:00:53.2 **HOT-1**	plus five		
11:01:01.5 **HOT-1**	[sound of gasp]		
11:01:01.6 **HOT-2**	[sound similar to increase in engine noise]		
11:01:02.6 **HOT-1**	push it push it push it push it full power full power		
11:01:05.2 **CAM**	[sound of rattle, similar to stick shaker]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
11:01:06.0			
CAM	[sound similar to impact for ten seconds to end of recording]		
11:01:19.7			
END OF TRANSCRIPT			
END OF RECORDING			