

National Transportation Safety Board

Office of Research and Engineering

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COCKPIT VOICE RECORDER

Group Chair's Factual Report

November 4, 2022

WARNING

The reader of this report is cautioned that the transcript of a cockpit voice recorder audio recording is not a precise science but is the best product possible from a National Transportation 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.

A. ACCIDENT

Location: El Cajon, California
Date: December 27, 2021
Time: 1914 Pacific standard time (PST)
Airplane: Aeromedevac Inc., Learjet 35A, N880Z

B. COCKPIT VOICE RECORDER GROUP

Group Chair	Michael Portman Aerospace Engineer – Recorder Specialist National Transportation Safety Board (NTSB)
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C. FEDERAL CARRIAGE REQUIREMENTS

Per federal regulation, turbine multiengine aircraft with at least six passenger seats and requiring two pilots manufactured prior to April 7, 2010, and operated under Title 14 *Code of Federal Regulations* (CFR) Part 135, must be equipped with a cockpit voice recorder (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 1985. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes of CVR operation.

D. DETAILS OF THE INVESTIGATION

A CVR group was convened on April 4, 2022. The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model:	Fairchild A-100A
Part Number:	Unknown
Recorder Serial Number:	Unknown

1.0 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).

1.1 Recorder Damage

Upon arrival at the laboratory, it was evident that the exterior of the CVR had sustained some heat and structural damage, as shown in figure 1. The outer case was removed, and the interior crash-protected case did not appear to have any heat or structural damage, as seen in figure 2. The magnetic tape was retrieved from within the crash-protected case, as shown in figure 3, and was successfully read out.



Figure 1. The CVR exterior, as received in the lab, showing thermal and structural damage.



Figure 2. The interior recording mechanism.



Figure 3. The recovered magnetic tape.

1.2 Audio Recording Description

Each channel's audio quality is indicated in Table 1.¹

Table 1. Audio Quality.

Channel Number	Content/Source	Quality	Duration (mm:ss)
1	Captain	Good	31:51
2	CAM	Fair	31:51
3	Observer	Good	31:51
4	First Officer	Good	31:51

1.3 Timing and Correlation

As no external sources were available to correlate the recorder to real world time, the transcript is presented in CVR elapsed time.

¹ Appendix A comprises the CVR Quality Rating Scale.

1.4 Description of Audio Events

The recording began at 00:00 (mm:ss) with the aircraft on the ground at John Wayne Airport (SNA) in Santa Ana, California. The crew were aboard completing various preflight and flight planning activities. The engines were started at 06:57, and the aircraft was cleared for takeoff at 13:18. The transcript began at the beginning of the takeoff roll at 14:15.

The aircraft was cleared for the RNAV runway 17 approach into Gillespie Field (SEE) at 21:09, and the crew subsequently briefed the approach, but with the intention to land on runway 27 right. The flight was handed to SEE tower and checked in at 25:56, at which point they were cleared to land on runway 17. At 29:38 the crew reported the airport in sight and requested a cancellation of their IFR flight plan and to land on runway 27 right.

The pilot instructed the copilot to begin their left circling turn at 30:51. Beginning at 31:22, the crew began reacting to the speed of the aircraft and made several comments about the precariousness of the approach. At 31:33, the pilot asked the copilot for control of the aircraft, to which the copilot agreed. Beginning at 31:45, numerous cockpit alerts began sounding as the crew continued reacting to the speed of the aircraft. The recording ended shortly thereafter at 31:50.

Submitted by:

Michael Portman
Aerospace Engineer – Recorder Specialist

APPENDIX A. 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.

APPENDIX B. CVR TRANSCRIPT

The following is a transcript of a Fairchild A-100A tape cockpit voice recorder, serial number unknown, installed on an Aeromedevac Inc Lear 35A N880Z, which crashed on December 27, 2021, during approach to Gillespie Field in El Cajon, California.

LEGEND

APR	Radio transmission from the SoCal approach controller
ATIS	Radio transmission from the SEE airport Automatic Terminal Information Service (ATIS)
CAM	Cockpit area microphone voice or sound source
DEP	Radio transmission from the SoCal departure controller
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from N880Z
SEE	Radio transmission from the SEE airport tower controller
SNA	Radio transmission from the SNA airport tower controller
-1	Voice identified as the pilot
-2	Voice identified as the copilot
-?	Voice unidentified
*	Unintelligible word
#	Expletive
@	Non-pertinent word
()	Questionable insertion
[]	Editorial insertion

Note 1: Times are expressed in CVR elapsed time.

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-Aircraft Communication	Time and Source	Over-the-Air Communication
00:00.0			
	START OF RECORDING		
06:56.7	[sounds consistent with engine start were noted]		
10:48.8	[the crew called ground and were issued taxi instructions]		
13:17.7	[the flight was cleared for takeoff]		
14:14.9			
	START OF TRANSCRIPT		
14:14.9	[increase in ambient noise consistent with application of takeoff power]		
CAM			
14:29.0	vee one.		
HOT-1			
14:30.7	rotate.		
HOT-1			
14:33.4	positive rate.		
HOT-1			
14:34.2	gear up yaw damper engage.		
HOT-2			
14:35.5	yaw damp's on I got nav mode on (there) for ya.		
HOT-1			

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:37.5 HOT-2	okay.		
14:40.1 HOT-1	** on for now.		
14:43.2 HOT-1	*.		
14:47.2 HOT-2	okay.		
14:47.5 HOT-1	plus thirty.		
14:49.0 HOT-2	flaps up.		
14:49.8 HOT-1	flaps up.		
14:50.3 HOT-1	(after) takeoff checklist.		
14:50.4 HOT-2	and after takeoff checklist.		
14:51.5 HOT-1	very good.		
14:52.6 HOT	[sound of electronic clicking, consistent with electronic trim]		

Time and
Source Intra-Aircraft Communication

14:55.5
HOT [sound of electronic clicking, consistent with
electronic trim]

14:58.4
HOT [sound of electronic clicking, consistent with
electronic trim]

15:01.2
HOT [sound of electronic clicking, consistent with
electronic trim]

15:10.5
HOT-2 ** we're not quite to nav yet.

15:12.6
HOT-1 okay.

15:13.6
HOT-1 it is one nine six okay.

15:15.8
HOT-2 'kayyy.

Time and
Source Over-the-Air Communication

15:01.5
SNA november eight zero zulu contact SoCal departure one two
eight point one.

15:04.8
RDO-1 twenty eight point one eight eight zero zulu good night.

15:16.8
RDO-1 and departure Lear eight eight zero zulu is a thousand feet
for five thousand feet one nine six on the heading.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		15:21.3 DEP	november eight eight zero zulu SoCal Departure radar contact and climb maintain five thousand for now I'll have higher in just a minute.
		15:29.4 RDO-1	(aright/climb) five thousand for now eight zero zulu.
15:31.2 HOT-1	yeah stay one ninety s— or no you (wanted/want it) one seventy seven.		
15:33.0 HOT-2	one seventy seven yeah.		
15:33.6 HOT-1	okay you're right you're right I'm sorry...you're right.		
15:37.6 HOT-2	'kay.		
15:38.7 HOT-1	there's one seventy seven there...yep you're good.		
15:40.7 HOT	[sound similar to autopilot disconnect tone]		
15:41.1 HOT-2	whoops my fault.		
15:42.3 HOT-2	reengage.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:43.7 HOT-1	you want...you want heading mode?		
15:45.6 HOT-2	(no I want nav).		
15:47.1 HOT-1	***.		
15:47.7 HOT-2	(nav nav).		
15:48.7 HOT-1	oh you do want nav?		
15:49.3 HOT-2	yeah we're on one seventy seven (we're nav-ing).		
15:51.0 HOT-1	yeah that's right okay.		
15:55.8 HOT	[sound of electronic clicking, consistent with electronic trim]		
15:57.6 HOT-1	okay **.		
		15:58.0 DEP	november eight zero zulu when able cleared direct to CARDI climb maintain one one thousand.
		16:02.5 RDO-1	direct to CARDI and one one thousand eight zero zulu.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
16:04.8 HOT-1	here you go.		
16:06.0 HOT-2	okay here we go.		
16:06.2 HOT-1	here comes the one one thousand...is set.		
16:08.5 HOT	[multiple intermittent sounds of electronic clicking, consistent with electronic trim, for approximately 40 seconds]		
16:09.5 HOT-1	and I'm gonna give you direct to CARDI which is great.		
16:14.5 HOT-1	activate there you go...nav's on...it's all yours bud.		
16:24.4 HOT-2	I guess that's speed...okay.		
16:35.4 HOT-2	***. [speech blocked by ATC]		
16:39.3 HOT-1	yeah that's what I was doin'.		
16:42.3 HOT-1	see if it comes in for ya I don't know if it will.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
16:46.7 HOT-2	there we go.		
16:47.6 HOT-1	there it is.		
16:51.4 HOT-1	okay...we're goin' direct to CARDI...		
16:58.5 HOT-1	eh it's got pretty cold I'm gonna turn on some nac heats ² .		
17:01.1 HOT-2	okay.		
17:03.8 HOT-1	looks like we're breaking out a little bit.		
17:08.2 HOT-2	* armed * . [speech obscured by overlapping ATC communications]		
17:14.2 HOT-1	that's pretty cool.		
		17:40.9 RDO-1	aaand SoCal Approach might be a little bit early but just uh for eight eight zero zulu we're looking for the G-P-S one seven into Gillespie.

² Referring to engine nacelle heating.

Time and
Source

Intra-Aircraft Communication

17:49.9
HOT

[sound of tone, consistent with altitude alert]

18:10.0
HOT-2

capturing and...

18:15.3
HOT

[electronic tone sound]

18:17.9
HOT-2

**.

Time and
Source

Over-the-Air Communication

17:46.7
DEP

and november eight zero zulu yeah you can make your request with the next sector you'll be talking to him here in a little bit uhh actually I'll flip you here in just a second you're gonna have traffic eleven o'clock he's twenty five miles opposite direction be descending to one two thousand it'll be an Airbus be stopping a thousand feet above.

18:00.3
RDO-1

all right we'll be looking for him eight eight zero zulu.

18:02.2
DEP

november eight eight zero zulu contact approach one two five point three with your request.

18:06.0
RDO-1

twenty five point three we'll see ya.

18:07.6
DEP

g'day.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		18:17.9 RDO-1	SoCal Approach good evening Lear eight eight zero zulu's checking in eleven thousand.
		18:23.4 APR	november eight eight zero zulu SoCal Approach good evening ATIS information golf's current at Gillespie advise when you have that the altimeter's two nine nine eight.
		18:30.0 RDO-1	two nine nine eight we'll let you know when we have golf and uh just so you know we're looking for uh the G-P-S one seven in there.
		18:35.4 APR	* eight eight zero zulu (you said) the uh R-NAV one seven?
		18:38.6 RDO-1	yessir.
		18:39.3 APR	eight zero zulu you can expect that and I'll have direct to ASIXY for ya shortly.
		18:43.5 RDO-1	thank you sir.
18:44.5 HOT-2	perfect.		
18:46.5 HOT-2	so is that loaded in there already?		

Time and
Source Intra-Aircraft Communication

18:48.1 yeah yeah.
HOT-1

18:59.4 and ten kay's and cruise...when you get a chance.
HOT-2

19:04.2 ten kay's and pressurization oxygen looks good
HOT-2 we're set there. * are set.

19:22.1 okay I got golf.
HOT-1

19:24.0 okay.
HOT-2

19:28.8 [electronic tone sound]
HOT

Time and Over-the-Air Communication
Source

18:49.1 landing and departing runway two seven right * information
ATIS available on flight service frequencies advise on contact
you have information golf. Gillespie Tower information golf
time zero two five five zulu wind's variable at five visibility
(two/three) mist ceiling two thousand broken two thousand
six hundred overcast temperature one zero dewpoint eight
altimeter two niner niner eight localizer (delta) approach in
use landing and departing runway two seven right *
information available on flight service frequencies advise on
contact you have information golf. Gillespie tower
information golf time zero two five five zulu wind–

19:31.1 and eight eight zero zulu we got information golf.
RDO-1

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		19:33.4 APR	eight eight zero zuluuuu roger.
19:34.2 HOT-1	watch your speed.		
19:34.5 HOT-2	I'm watchin' it.		
19:35.6 HOT-1	okay.		
19:37.3 HOT-2	I don't wanna buy two beers.		
19:39.3 HOT-1	ya hahaha.		
19:41.6 HOT-1	all right twenty four thirty four.		
19:55.5 HOT-2	'kay that was uhh twenty four was our bugs right?		
19:57.9 HOT-1	twen– yep twenty four thirty four.		
20:00.0 HOT-2	thirty four thirty...one twenty four...		
20:07.8 HOT-1	okay good good good good (generators) we leave those on it's all good...still have the nacs on...we'll turn em off for now.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
20:18.0 HOT-1	kay cruise pressurization fuel management is all balanced for you nothin' in the trunk...that's good...kay cruise is fuel management * pressurization is good set to field you're already there engine instruments everything is good.		
		20:33.4 APR	november eight zero zulu traffic eleven o'clock ten miles northbound Airbus at one three thousand.
		20:39.1 RDO-1	and eight eight zero zulu we're lookin' – I – I – traffic in sight eight eight zero zulu.
20:42.6 HOT-2	and uhh...let's do the approaches.		
20:45.2 HOT-1	yeah...we'll get your windshield heat back on.		
20:49.1 HOT-1	altimeter's set recogs are good...two nine nine eight in Gillespie we'll have to change that as soon as we start the descent. I will.		
20:54.1 HOT-2	I see it.		
20:55.9 HOT-1	okay circuit breakers.		
20:57.3 HOT-2	in on my side.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
20:57.9 HOT-1	they're in on my side.		
20:59.9 HOT-1	and no smoke and fasten seatbelt sign is still on ** on.		
		21:02.0 APR	eight eight zero zulu you're...uh you can proceed direct to ASIXY.
21:02.7 HOT-2	yep.		
		21:06.0 RDO-1	direct to ASIXY eight eight zero zulu.
		21:08.6 APR	eight eight zero zulu you're twenty two miles from ASIXY cross ASIXY at or above five thousand cleared the R-NAV runway one seven approach.
		21:14.3 RDO-1	aright cleared for the R-NAV one seven approach cross ASIXY at or above five thousand eight eight zero zulu.
21:21.4 HOT-1	here you go...I'mma give you five thousand. I've got that in there.		
21:22.0 HOT	[sound of electronic clicking, consistent with electronic trim]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
21:27.3 HOT	[sounds of electronic clicking, consistent with electronic trim]		
21:33.9 HOT-1	okay.		
21:36.1 HOT-1	and...nineteen hundred feet a minute should get you there.		
21:38.4 HOT-2	okay I gotta slow down first.		
21:40.1 HOT-1	yeah.		
21:48.4 HOT-1	okay.		
21:49.9 CAM	[sounds consistent with decreasing engine thrust]		
22:06.6 HOT-1	okay so inbound course is gonna be one forty seven we're gonna inter-intercept at JUGAL at twenty five hundred feet...our M-D-A is gonna be thirteen sixty. airport elevation we know what that is three seventy nine. missed approach fifteen hundred and three thousand...our temperatures they're * heat's goin' back on.		
22:22.9 CAM	[sounds of switching]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
22:24.9 HOT	[sounds of intermittent electronic clicking, consistent with electronic trim]		
22:28.0 HOT-1	okay...ten thousand two fifty good work.		
22:33.5 HOT-1	and just so you know the PAPI on one seven is out.		
22:37.2 HOT-2	okay.		
22:38.9 HOT-2	well we don't care we're goin' to two seven.		
22:40.0 HOT-1	we don't...nope we don't care...but to keep on the glide path...uh...about...seven fifty...feet per minute...should get you there.		
22:50.7 HOT	[sounds of intermittent electronic clicking, consistent with electronic trim]		
23:03.6 HOT-1	okay...fuel's good approach setup and brief we just did it...bleed valves are still normal.		
23:10.6 HOT-1	the before is next.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
23:25.9 HOT-2	*** seventeen (seventy) *. [speech obscured by ATC transmission]		
23:36.1 HOT-1	yeah.		
23:42.2 HOT-2	'kay.		
23:44.4 HOT-?	oop...sorry...I was just gonna tell you sit down.		
23:47.5 HOT	[sounds of laughter from both pilots]		
23:54.9 HOT	[sound of electronic clicking, consistent with electronic trim]		
24:44.0 HOT-?	okay.		
24:46.8 HOT-2	so it's five thousand ASIXY comin up on five thousand.		
24:48.5 HOT	[sound similar to altitude alert]		
24:50.5 HOT-1	yup.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
24:51.2 HOT-2	almost to ASIXY and then after that * we'll start slowin' down...		
24:56.0 HOT-1	yep.		
24:56.6 HOT-2	two hundred knots.		
24:58.0 HOT-1	yep good idea.		
25:04.9 HOT-2	and then after ASIXY we're...we can go down to what?		
25:07.3 HOT-1	down to twenty five hundred.		
25:15.0 HOT-2	hope that levels off just a hair...slow it down.		
25:19.0 HOT-1	'kay goin to JUGAL now.		
		25:19.7 APR	Lear eight zero zulu contact Gillespie tower one two zero point seven.
25:19.9 HOT-2	heading *...heading down to twenty five hundred and armed right?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		25:23.5 RDO-1	two zero point seven Lear eight zero zulu *.
25:26.6 HOT-1	twenty five hundred...is set...and twelve hundred feet a minute will get you there.		
25:30.6 HOT-2	'kay.		
25:31.5 HOT-1	altitude select is armed...you want your nav back on?		
25:34.0 HOT-2	yes.		
25:35.3 HOT-1	there it is it's captured.		
25:36.1 HOT-2	how did it get off?		
25:37.2 HOT-1	it kicked off but it's back on...we got it.		
25:38.4 HOT-2	yeah...kay.		
		25:41.9 RDO-1	Gillespie Tower Lear eight eight zero zulu is with you on the I-L-S-or I'm sorry on the R-NAV one seven.
		25:48.1 APR	eight zero zulu Gillespie tower is one two zero point seven.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
25:51.3 HOT-1	oops.		
		25:51.8 RDO-1	sorry.
25:53.2 HOT	[electronic tone, freq switch]		
		25:55.9 RDO-1	and Gillespie Tower Lear eight eight zero zulu is with you on the...G-P-S one seven. *.
		26:01.5 SEE	* Learjet eight eight zero zulu Gillespie Tower. winds one niner zero at five runway one seven cleared to land.
		26:08.0 RDO-1	runway one seven cleared to land eight eight zero zulu.
26:11.0 HOT-2	'kay we'll have to cancel and then make a left...right?		
26:12.6 HOT-1	yep yep.		
26:14.8 HOT-1	all right it's looking good coming down to twenty five hundred.		
26:18.5 HOT-1	little over a thousand feet to go.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
26:21.4 HOT-1	(about) five miles to JUGAL.		
26:25.9 HOT-1	after JUGAL we'll have that uh...		
26:28.1 HOT-2	fourteen forty is it after JUGAL or no there's one more in between?		
26:30.9 HOT	[altitude alert]		
26:31.3 HOT-1	that's uhh..thirt–		
26:32.5 HOT-2	the hee– hiyak or something [pronouncing HIRAK].		
26:33.9 HOT-1	uhh there's TOMTY but there's nothing–		
26:35.6 HOT-2	oh TOMTY right.		
26:36.2 HOT-1	yeah yeah HIYAK [HIRAK] is the actual missed approach point but so we'll go down to thirteen– thirteen sixty.		
26:54.6 HOT-2	'kay altitude is armed.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
26:56.2 HOT-1	altitude is armed.		
27:02.0 HOT-1	capturing.		
27:02.4 HOT-2	capturing...go ahead and give me flaps eight.		
27:06.2 CAM	[sound of lever]		
27:07.3 HOT-1	flaps eight...indicated.		
27:08.5 HOT-2	kay.		
27:09.8 CAM	[increase in ambient noise, consistent with engine power up]		
27:15.7 HOT-1	we got some ground reference already.		
27:23.8 HOT-2	coming up on JUGAL...and then what after JUGAL?		
27:26.3 HOT-1	JUGAL you can just...it's gonna intercept your glide path and you can see it comin' in?		
27:29.1 HOT-2	oh I see okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
27:29.3 HOT-1	so you just pitch for seven fifty on your...		
27:31.2 HOT-2	okay.		
27:31.3 HOT-1	...V-S-I.		
27:34.4 HOT-2	gimme uh...flaps twenty.		
27:37.0 HOT	[sound similar to gear horn]		
27:37.1 HOT-1	flaps twenty...gear.		
27:38.6 HOT-2	gear down.		
27:39.5 HOT-1	gear down.		
27:39.6 HOT-2	and before landing checklist.		
27:39.8 CAM	[increase in ambient noise, consistent with gear down]		
27:41.1 HOT-1	there it comes.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
27:41.7 HOT	[bleedover tone of engine igniters, remains on throughout the remainder of the recording]		
27:48.9 HOT-1	okay it's capturing...I don't know if it'll hold it but it's capturing it now on the glide path.		
27:53.7 HOT-2	'kay.		
27:55.0 HOT-1	so you're looking good now.		
27:57.5 HOT-1	and there's one fifty.		
27:59.6 HOT-1	and I'm sorry we're gonna circle so we're gonna leave it at twenty.		
28:01.9 HOT-2	right.		
28:03.3 HOT	[altitude alert]		
28:04.6 HOT-1	okay we're goin' down to thirteen sixty is what we go down to.		
28:14.3 HOT-2	'kay you gonna set that to thirteen sixty?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
28:16.7 HOT-1	okay so this is turn— oh the page is comin' back. yeah okay.		
28:19.7 HOT-2	yeah.		
28:22.1 HOT-1	nah I'm gonna watch it that's your minimums I'm I'm gonna set fifteen hundred which is your missed.		
28:25.8 HOT-2	okay.		
28:27.2 HOT-1	actually.		
28:28.7 HOT-2	altitude armed...fifteen hundred.		
28:32.1 HOT-2	oh it's on...nevermind.		
28:32.6 HOT-1	actually I'll do fourt—		
28:34.1 HOT-2	it's on the glideslope right now.		
28:36.0 HOT-1	yeah.		
28:37.2 HOT-2	okay good.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
28:44.6 HOT-2	I don't see anything yet do you?		
28:46.4 HOT-1	I don't either.		
28:51.0 HOT-2	I thought we'd go down to thirteen sixty.		
28:51.5 HOT-1	uhh...		
28:53.9 HOT-1	we do we go down to thirteen sixty so we got about three hundred feet to minimums.		
28:56.8 HOT-2	'kay.		
29:02.8 HOT-2	I'm starting to see some stuff.		
29:04.3 HOT-1	okay...two hundred feet to minimums.		
29:13.8 HOT-1	hundred feet.		
29:15.4 HOT-1	sixty feet.		
29:16.4 HOT-2	I don't see anything.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
29:18.4 HOT-1	I don't see anything either– oh I got it.		
29:20.1 HOT-2	okay.		
29:20.6 HOT-1	I got it.		
29:22.2 HOT-1	no we're good.		
29:25.9 HOT-1	there it is.		
29:26.9 HOT-2	'kay.		
29:29.9 HOT	[sound similar to altitude alert]		
29:31.5 HOT-1	that'd be one to go.		
		29:37.7 RDO-1	and we have airport in sight we'd like to squawk V-F-R for uh eight eight zero zulu.
		29:42.5 SEE	Learjet eight zero zulu roger runway one seven cleared to land.
29:45.9 HOT-2	'kay do you see it?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		29:46.4 RDO-1	and (I'd) like to take uh...runway uh two seven eight eight zero zulu.
		29:50.2 SEE	Learjet eight eight zero zulu understand you're uh then you're cancelling I-F-R?
		29:53.2 RDO-1	yes sir.
		29:54.0 SEE	Learjet eight zero zulu I-F-R cancellation received you can overfly the field and make left traffic runway two seven right...***...change to runway two seven right cleared to land.
29:55.2 HOT-1	okay level off.		
29:56.8 HOT-1	level off.		
29:59.4 HOT	[sound similar to autopilot disconnect]		
		30:02.5 RDO-1	(clear) two seven right cleared to land eight eight zero zulu.
		30:05.3 RDO-1	and can you turn up the lights for us a little bit more?
30:05.3 HOT-2	where is the runway?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		30:07.4 SEE	they're at a hundred percent now.
30:08.9 HOT-2	perfect I got it now.		
30:09.9 HOT-1	you got it?		
30:10.6 HOT-2	yeah.		
30:11.1 HOT-1	'kay...all right you're slowin' down.		
30:20.3 HOT-1	'kay you got the airport right?		
30:21.4 HOT-2	yep I got the airport I got runway one seven we're gonna head right down the runway.		
30:25.1 HOT-1	yep.		
30:25.6 HOT-2	and then we'll just uhh...make a left.		
30:26.9 HOT-1	yes...yep stay here jus—		
30:28.4 HOT-2	'kay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
30:37.1 HOT-1	and don't go any lower.		
30:37.8 HOT-2	'kay call my left okay?		
30:39.2 HOT-1	yep I will.		
30:49.3 HOT-1	'kay.		
30:50.1 HOT-2	left turn?		
30:50.8 HOT-1	yep make your left turn.		
31:01.1 HOT-1	just watch your speed.		
31:02.5 HOT-2	yeah I'm watching it.		
31:03.2 HOT-1	I'll give you your ten flaps when you're ready ready.		
31:06.6 HOT-1	'kay straighten out.		
31:07.6 HOT-2	'kay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
31:08.9 HOT-2	gimme flaps forty.		
31:11.9 CAM	[sound of lever]		
31:12.2 HOT-1	flaps forty is...		
31:15.3 HOT-1	okay.		
31:16.0 HOT-2	okay.		
31:16.7 HOT-2	tell me when to turn left.		
31:16.8 HOT-1	make it make it.		
31:17.7 HOT-1	you can go ahead and make your turn.		
31:19.6 HOT-2	'kay...oh I see that little mountain...okay.		
31:21.2 HOT-1	yep.		
31:22.1 HOT-2	woah woah woah speed speed.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
31:22.3 HOT-1	woah woah woah.		
31:23.8 HOT-2	'kay.		
31:25.0 HOT-1	'kay go around the mountain.		
31:26.3 HOT-2	go around the mountain.		
31:27.1 HOT-1	yep.		
31:28.1 HOT-1	[sounds similar to heavy breathing]		
31:28.2 HOT-2	'kay.		
31:31.5 HOT-1	this is dicey.		
31:32.7 HOT-2	yeah it's very dicey.		
31:33.0 HOT-1	here let me take it on this turn.		
31:34.1 HOT-2	yes you ta– you fly.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
31:34.3 HOT-1	[sounds of heavy breathing]		
31:35.7 HOT-2	'cause it's visual... 'kay?		
31:36.7 HOT-1	yeah.		
31:37.5 HOT-2	aright.		
31:38.2 HOT-1	watch my speed for me.		
31:39.0 HOT-2	speed speed speed.		
31:39.8 HOT-1	[sounds of heavy breathing]		
31:40.1 HOT-2	more more.		
31:43.1 HOT-2	more more.		
31:43.7 HOT-2	(go) faster faster.		
31:44.0 HOT-1	[sounds of heavy breathing]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
31:44.5 HOT	[sound similar to yaw dampener disconnect]		
31:45.9 HOT-2	oh # it's over.		
31:45.9 HOT	[sound of 1136Hz tone, in a pattern of two double beeps]		
31:46.2 HOT-1	oh #.		
31:47.4 HOT-1	oh #.		
31:48.4 HOT-1	oh #.		
31:49.4 HOT-1	[sounds of screaming, plays throughout the remainder of the recording]		
31:50.2 END OF TRANSCRIPT END OF RECORDING			