

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



**GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION**

**DCA13FA131**

**By  
Christopher Babcock**

**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 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**  
Vehicle Recorder Division  
Washington, DC 20594

August 16, 2013

## **Cockpit Voice Recorder**

**Group Chairman's Factual Report**  
**By Christopher Babcock**

### **1. EVENT**

Location: Flushing, New York  
Date: July 22, 2013, 1745 Eastern Daylight Time (EDT)<sup>1</sup>  
Aircraft: Boeing 737-700  
Operator: Southwest Airlines, Flight 345  
Registration: N753SW  
NTSB Number: DCA13FA131

### **2. GROUP**

A group was convened on July 26, 2013.

Chairman: Christopher Babcock  
Aerospace Engineer  
National Transportation Safety Board

Member: Captain Jeff Hamlett  
Director of Flight Safety  
Southwest Airlines

Member: Dave Keenan  
Air Safety Investigator  
Federal Aviation Administration

Member: Captain Wiley Moore  
Safety Pilot  
Boeing

Member: Captain Alan Roy  
Air Safety Investigator  
Southwest Airline Pilots Association

---

<sup>1</sup> All times are expressed in local EDT, unless otherwise noted

### 3. SUMMARY

On July 22, 2013, a Southwest Airlines Boeing 737-700, registration N753SW, experienced a failure of the nose landing gear upon landing at LaGuardia Airport, Flushing, New York. The flight was operating under Title 14 Code of Federal Regulations (CFR) Part 121 as a scheduled passenger flight from Nashville, TN, to LaGuardia. The aircraft sustained substantial damage to its undercarriage.

The solid-state cockpit voice recorder (CVR) from the aircraft was sent to the National Transportation Safety Board's Audio Laboratory for evaluation. The CVR group meeting convened on July 26, 2013, and a complete transcript was prepared for final 30 minutes and 8 seconds of the recording. An additional 4.5 minute portion of the recording surrounding the approach briefing was also completely transcribed.

### 4. DETAILS OF INVESTIGATION

On July 23, 2013, the NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **Honeywell 965-6022**

Recorder Serial Number: **2333**

#### 4.2. Recorder Description

Per federal regulation, US registered aircraft requiring two pilots and containing six or more passenger seats, and operating under 14 CFR Part 121, must be equipped with a CVR that records a minimum of the last 2 hours of audio data; 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 2 hours of aircraft operation.

This model CVR, the Honeywell 965-6022, records 2 hours of digital audio on a continuous loop in a 5-channel format.

#### 4.3. 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.

#### 4.4. CVR Channels

The recording consisted of five channels of audio information. Three of the channels contained excellent quality audio information from the pilot's, copilot's, and auxiliary audio panels of 30 minutes duration.<sup>2</sup> One channel contained good quality CAM audio information of 2 hours duration. One channel contained excellent quality audio information from the three audio panels mixed together of 2 hours duration. Figure 1 shows a schematic of the channels recorded.

---

<sup>2</sup> See Attachment I for the CVR Quality Rating Scale

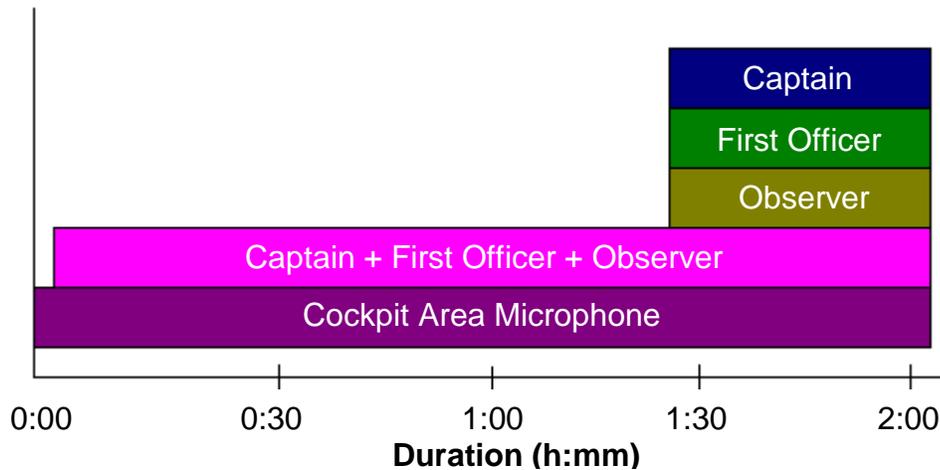


Figure 1. CVR channel schematic.

#### 4.5. Timing and Correlation

Timing on the recording was determined by synchronizing the VHF radio transmissions from the aircraft recorded on the CVR with the corresponding activations of the Key-VHF1 parameter on the flight data recorder (FDR). A 4 hour offset was applied to convert from the Time-UTC parameter on the FDR to local EDT.

Timing on the transcript was established by correlating the last five radio transmissions from the aircraft with the corresponding activations of the Key-VHF1 parameter on the FDR. Each of the radio transmissions acted as an anchor point for a linear interpolation between the remaining CVR events. A linear function of the form

$$FDR\_SRN = m * CVR + b, \quad (1)$$

was fit to the data where  $m$  is the slope of the interpolation and  $b$  is the offset. Using the values in Table 2 the correlation between CVR elapsed time and FDR subframe reference number is:

$$FDR\_SRN = 1.0 * CVR + 90453.5 \quad (2)$$

Table 1. Begin and end times of events used to correlate CVR and FDR (times are in seconds).

FDR Start <sup>a</sup>	FDR Stop <sup>a</sup>	CVR Start	CVR Stop
97571.8	97573.8	7117.3	7120.8
97699.8	97700.8	7246.0	7248.1
97703.8	97703.8	7250.0	7251.2
97712.8	97713.8	7258.5	7261.0
97721.8	97722.8	7267.7	7270.3

<sup>a</sup> Transmissions recorded on the FDR are discrete events sampled once per second. The actual transmission may have begun up to 1 second prior to the indicated FDR Start time and may have ended up to 1 second after the indicated FDR Stop time.

#### **4.6. Summary of Recording Contents**

The recording began at 1539:47 EDT with the aircraft in cruise toward New York. It contained events from the cruise, descent, landing, and accident sequences. The recording ended at 1744:56 EDT, shortly after the aircraft departed the runway. A jump seat occupant was present during the flight but his voice was not present in the transcribed portion of the recording

As part of the investigation, the flight crew was invited to review the CVR recording and transcript and suggest corrections or additions. They have declined this invitation through their representative.

Christopher Babcock  
Aerospace Engineer  
Vehicle Recorder Division

## 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.

**Transcript of a cockpit voice recorder installed on a Southwest Airlines Boeing 737-700 (N753SW) that experienced a nose gear failure at LaGuardia Airport, Flushing, NY.**

## **LEGEND**

<b>CAM</b>	Cockpit area microphone voice or sound source
<b>HOT</b>	Flight crew audio panel voice or sound source
<b>PA</b>	Public address system announcement
<b>INT</b>	Crew intercom audio
<b>ZDC</b>	Radio transmission from Washington Center controller
<b>NYC</b>	Radio transmission from New York Approach controller
<b>TWR</b>	Radio transmission from LaGuardia Tower controller
<b>UA1259</b>	Radio transmission from United Airlines flight 1259
<b>WN19</b>	Radio transmission from Southwest Airlines flight 19
<b>UA1049</b>	Radio transmission from United Airlines flight 1049
<b>-1</b>	Voice identified as the captain
<b>-2</b>	Voice identified as the first officer
<b>-3</b>	Voice identified as flight attendant
<b>-4</b>	Voice identified as flight attendant
<b>-?</b>	Voice unidentified
<b>-A</b>	First identified facility controller
<b>-B</b>	Second identified facility controller
<b>*</b>	Unintelligible word
<b>#</b>	Expletive
<b>@</b>	Non-pertinent word
<b>( )</b>	Questionable insertion
<b>[ ]</b>	Editorial insertion

Note 1: Times are expressed in Eastern Daylight Time.

Note 2: Generally, only radio transmissions to and from the incident 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
15:39:47.5	<b>START OF RECORDING</b>		
16:29:08.3	<b>START OF APPROACH BRIEFING</b>		
16:29:08.3	<b>HOT-1</b> what's that runway?		
16:29:09.6	<b>HOT-2</b> four.		
16:29:12.5	<b>HOT-1</b> you want flaps forty?		
16:29:14.6	<b>HOT-2</b> ah yes ma'am that'd be great.		
16:29:16.5	<b>HOT-1</b> okay.		
16:29:19.2	<b>HOT-2</b> yeah since it's wet and stuff. yup.		
16:29:19.5	<b>HOT-1</b> yeah.		
16:29:29.1	<b>HOT-1</b> okay twenty eight thirty four with brackets.		
16:29:31.4	<b>HOT-2</b> right.		
16:29:36.9	<b>HOT-1</b> and twenty eight what is it thirty four. so that's plus six?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
16:29:40.7 <b>HOT-1</b>	yes.		
16:29:41.8 <b>HOT-2</b>	twenty eight thirty four you bet.		
16:29:45.4 <b>HOT-2</b>	thank you much.		
16:30:28.6 <b>HOT-1</b>	you can go through it if you want.		
16:30:29.9 <b>HOT-2</b>	okay. alright we'll go through it here.		
16:30:32.3 <b>HOT-2</b>	we got uh Gor— Gordonsville...then on in to uh COLIN...Patuxent River...looks like uh GAR— GARED...RIDGY at or above flight level two seven zero...		
16:30:46.9 <b>HOT-2</b>	Smyrna at or above flight level four— uh two four zero...we go in to uh SKIPY at or above flight level one nine zero. BESSI at or above seventeen. EDJER...DAVYS at or above thirteen. HOLEY. we got a note B on that one. see what that— I don't see that B anywhere. on HOLEY. you see anything there on the box? no? alright it's probably the holding. BRAND at or above eleven.		
16:31:19.9 <b>HOT-1</b>	kay.		
16:31:20.2 <b>HOT-2</b>	KORRY at ten. uh Robbinsville ... TYKES... MINKS ... RENUE...APPLE...PROUD. expect radar vectors from there. on to LaGuardia. got runway four. I think we'll have the weather for the visual. what do you think?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
16:31:37.4 <b>HOT-1</b>	yeah I think so too.		
16:31:38.0 <b>HOT-2</b>	yeah you're right.		
16:31:38.8 <b>HOT-2</b>	one— one ten dot five zero four four course. twenty one on the uh touchdown zone elevation...uh DNNIS seventeen hundred...good to go. got MALSR PAPIs to help us out. autobrakes three. wet-good. we'll uh...stop at whatever wherever we can. if we go past the uh runway probably uniform romeo then back over to uh gate bravo four.		
16:32:08.7 <b>HOT-2</b>	okay that's around the back side and there is a ramp there. that you got to monitor ground and ramp at the sa— at the same time as I remember.		
16:32:19.9 <b>HOT-1</b>	okay.		
16:32:25.0 <b>HOT-2</b>	yeah so uh alpha and then on in.		
16:32:30.1 <b>HOT-1</b>	oh okay.		
16:32:30.8 <b>HOT-2</b>	yeah contact United ramp control for push clearance and entry to alleyway on arrival. yeah.		
16:32:38.9 <b>HOT-1</b>	okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
16:32:40.0	<b>END OF APPROACH BRIEFING</b>		
17:14:07.1	<b>START OF TRANSCRIPT</b>		
17:14:07.1	<b>CAM</b> [sound similar to ACARS tone]		
17:14:08.5	<b>HOT-1</b> ah zulu.		
17:14:18.6	<b>HOT-1</b> the winds about the same...it's actually got a little bit better on the scattered and the broken.		
17:14:23.8	<b>HOT-2</b> nice.		
17:14:27.8	<b>HOT-1</b> two nine eight six. still using four. no big changes.		
17:14:32.8	<b>HOT-2</b> alrighty.		
		17:14:33.2	<b>ZDC-A</b> Southwest three forty five descend and maintain flight level two four zero.
		17:14:36.3	<b>RDO-1</b> down two four zero Southwest three forty five.
		17:14:38.7	<b>ZDC-A</b> Southwest three forty five no delay down to that altitude. Washington one two five point four five.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		17:14:43.2 <b>RDO-1</b>	one two five four five and no delay down Southwest uh three forty five.
17:14:46.7 <b>HOT-2</b>	twenty four.		
17:14:50.1 <b>HOT-1</b>	four five.		
		17:14:55.4 <b>RDO-1</b>	center Southwest uh three forty five is out of three one zero for two four zero and we're hustling down.
		17:15:00.5 <b>ZDC-B</b>	Southwest three forty five roger.
17:15:03.5 <b>HOT-1</b>	uh ohhh. chuh chuh chuh chuh chuh chuh...		
17:15:25.7 <b>HOT-1</b>	okay I'm off.		
17:15:26.8 <b>HOT-2</b>	alright.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:15:48.1 <b>PA-1</b>	well ladies and gentlemen we are heading towards LaGuardia and uh we have started uh part of the— the first part of the descent in to LaGuardia at this time. the fasten seatbelt sign is still on at this time. please make sure you're seated with your seatbelts fastened a couple good storms coming up uh that are going to be on our right hand side. currently down at LaGuardia seventy eight degrees. they do got uh clouds in the area and a light wind. um if they don't delay us again we're looking at about uh being forty five minutes late uh into the gate. again we do apologize for the delay and um we thank you for your patience. hope you have a wonderful day.		
17:16:30.3 <b>HOT-1</b>	I'm back.		
17:16:30.7 <b>HOT-2</b>	alrighty no change.		
17:16:50.2 <b>HOT-1</b>	okay let's bring that up here. God I can't see anything with all this # dust.		
17:16:59.1 <b>HOT-2</b>	that's a good one over there to the right.		
17:17:01.1 <b>HOT</b>	[sound similar to altitude alert]		
17:17:01.9 <b>HOT-1</b>	*		
17:17:03.2 <b>HOT-2</b>	five to four.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:17:05.1 <b>HOT-1</b>	twenty four eight twenty four.		
		17:17:11.0 <b>ZDC-B</b>	Southwest three forty five direct DAVYS.
17:17:14.9 <b>HOT-1</b>	uh what is it?		
17:17:16.2 <b>HOT-2</b>	DAVYS.		
		17:17:16.7 <b>RDO-1</b>	direct to DAVYS Southwest three forty five.
17:17:18.8 <b>HOT-1</b>	I hi—		
17:17:19.2 <b>HOT-2</b>	LNAV.		
17:17:19.3 <b>HOT-1</b>	okay good.		
17:17:19.7 <b>HOT-2</b>	okay.		
17:17:20.0 <b>HOT-1</b>	I was just going to make sure they're gonna go through that crowd.		
17:17:20.7 <b>HOT-2</b>	yeah...crowd yeah. [sound of laughter]		
17:17:23.4 <b>HOT-1</b>	the cloud there. okay DAVYS is good.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:17:25.2 <b>HOT-2</b>	the cloud the cloud.		
17:17:44.0 <b>HOT-1</b>	well we're going to have to do something up here.		
17:17:50.2 <b>HOT-2</b>	* that one's right there right?		
17:17:52.7 <b>HOT-1</b>	no I'm talking about straight ahead.		
17:17:53.7 <b>HOT-2</b>	yeah.		
17:17:54.0 <b>HOT-1</b>	yeah.		
17:17:54.4 <b>HOT-2</b>	let's split the gap here. right now we have— definitely want to go right yeah.		
17:17:57.0 <b>HOT-1</b>	well I— I— le— let me get a little closer * can bring it up.		
17:17:58.8 <b>HOT-2</b>	closer to it looks like yeah.		
17:18:00.4 <b>HOT-1</b>	see what it says that uh—.		
17:18:02.0 <b>HOT-2</b>	yeah.		
17:18:03.6 <b>HOT-1</b>	well I'm sure he's got a plan.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:18:05.1 <b>HOT-2</b>	plan yeah.		
17:18:05.5 <b>HOT-1</b>	they— they been doing pretty good so far.		
17:18:06.9 <b>HOT-2</b>	good so far. right yeah.		
17:18:11.0 <b>HOT-2</b>	maybe up and around to the right?		
		17:18:16.8 <b>UA1259</b>	uh this weather up ahead uh you say no problem going through then?
		17:18:21.2 <b>ZDC-B</b>	uh no problem at all. just had 'bout six or seven go right through uh right on the arrival. looks pretty good.
17:18:25.7 <b>HOT-2</b>	uh alright yeah hah.		
		17:18:26.6 <b>UA1259</b>	okay very well then we'd like lower if we could.
		17:18:30.5 <b>ZDC-B</b>	twelve fifty nine descend via the KORRY Three arrival. Philly altimeter two nine eight one.
17:18:33.9 <b>HOT-1</b>	okay that's us.		
17:18:35.2 <b>HOT-2</b>	yup.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:18:35.3 <b>HOT-1</b>	um I'm going to put in uh where are we now?		
17:18:37.7 <b>HOT-2</b>	okay.		
17:18:38.6 <b>HOT-1</b>	two four zero.		
17:18:39.6 <b>HOT-2</b>	yup.		
17:18:42.1 <b>HOT-1</b>	that look good?		
17:18:42.9 <b>HOT-2</b>	yup.		
		17:19:19.6 <b>ZDC-B</b>	Southwest nineteen uh after BESSI if you need to deviate a little— a little to the left that's approved. and direct to METRO when able Southwest nineteen after BESSI.
17:19:25.8 <b>HOT-2</b>	[sound of laughter] split the gap.		
17:19:40.0 <b>HOT-1</b>	yeah looks like we might have to cheat a little to the right.		
17:19:42.7 <b>HOT-2</b>	right okay.		
17:19:43.8 <b>HOT-1</b>	and we'll just wait until we're a little closer.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:19:45.4 <b>HOT-2</b>	closer yup. and get a little bit better...		
17:19:47.3 <b>HOT-1</b>	yeah.		
17:19:50.0 <b>HOT-2</b>	...resolution on it here.		
17:20:13.2 <b>HOT-1</b>	I'm off.		
17:20:18.5 <b>CAM</b>	[sound of two clicks]		
17:20:19.9 <b>INT-3</b>	this is @.		
17:20:20.7 <b>INT-1</b>	hey you guys I was just going to go ahead and ding you a little early.		
17:20:23.2 <b>INT-3</b>	okay.		
17:20:23.3 <b>INT-1</b>	and then that way you guys can get cleaned up and sit down. it's going to get a little bumpier as we start our— the next part of our descent.		
17:20:28.6 <b>INT-?</b>	okay sounds good.		
17:20:28.9 <b>INT-?</b>	alrighty.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:20:30.0 <b>INT-1</b>	okay thanks.		
17:20:30.5 <b>INT-?</b>	thank you.		
17:20:32.7 <b>HOT-1</b>	they're going to sit down.		
17:20:33.9 <b>HOT</b>	[sound of double chime]		
17:20:34.4 <b>HOT-2</b>	perfect.		
		17:20:51.1 <b>RDO-1</b>	center Southwest three forty five uh as soon as we get towards DAVYS we might need to cheat a little bit to the uh right cause of that weather.
		17:20:58.1 <b>ZDC-B</b>	who's that?
		17:20:59.1 <b>RDO-1</b>	Southwest three four five.
		17:21:01.8 <b>ZDC-B</b>	* everybody's getting through just fine. when you get a little closer we'll reevaluate. Southwest three forty five descend via the KORRY Three arrival. Philly altimeter two nine eight one. I got someone right in front of you. I'll keep you posted.
17:21:05.9 <b>HOT-1</b>	okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		17:21:11.0 <b>RDO-1</b>	okay copy that. we'll descend via the KORRY Three arrival. Southwest three forty five.
17:21:14.7 <b>HOT-2</b>	ten thousand maybe?		
17:21:16.0 <b>HOT-1</b>	ummm I'm seeing ten. looks good to me.		
17:21:19.8 <b>HOT-2</b>	okay. V-naving it. path. LNAV. alright. here we go.		
17:21:23.2 <b>HOT-1</b>	uh you're in speed...hit uhhhh altitude hold for a minute. for some reason you're in speed.		
17:21:31.8 <b>HOT-1</b>	oh I see. it was starting to drop your speed down. what for?		
17:21:36.4 <b>HOT-2</b>	VNAV because uhhh...		
17:21:39.2 <b>HOT-1</b>	okay.		
17:21:39.6 <b>HOT-2</b>	...at our cruise right now we're at point six two.		
17:21:43.0 <b>HOT-1</b>	did you increase it or something to outside of normal?		
17:21:46.2 <b>HOT-2</b>	yeah yeah I— I ended up at uh after we left holding there uh point seven one five...		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:21:51.1 <b>HOT-1</b>	oh okay.		
17:21:51.6 <b>HOT-2</b>	...then I switched it over to two hundred eighty knots.		
17:21:55.2 <b>HOT-1</b>	okay.		
17:21:56.3 <b>HOT-2</b>	yeah.		
17:21:56.7 <b>HOT-1</b>	that's why I thought it was starting down. I was think— trying to figure out why was it starting down now.		
17:22:01.7 <b>HOT-2</b>	okay.		
17:22:03.5 <b>HOT-1</b>	alright.		
		17:22:08.6 <b>ZDC-B</b>	Southwest nineteen continue descent. descend via the Philbo Three. Philly altimeter two niner eight one. just descend abeam the waypoints if you need to deviate a little left.
		17:22:17.1 <b>WN19</b>	okay descend via and uh we'll descend er descend via the Philbo Three and then uh descend via the abeam points uh Southwest nineteen.
17:22:25.2 <b>HOT-2</b>	hah.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:22:26.6 <b>HOT-1</b>	whatever.		
17:24:06.5 <b>HOT-?</b>	[sound similar to cough]		
		17:24:21.7 <b>UA1049</b>	uh ten forty nine they have any trouble on the arrival with uh weather?
17:24:26.6 <b>HOT-2</b>	[sound of laughter]		
		17:24:27.5 <b>ZDC-B</b>	uh on the arrival we're good.
17:24:37.3 <b>HOT-2</b>	the question of the hour. 'hey any problems on arrival?'		
17:24:52.1 <b>HOT-2</b>	ready you want to weave in and out?		
17:24:56.1 <b>HOT-1</b>	weave in and out of what?		
17:24:57.2 <b>HOT-2</b>	weave a little bit to the left?		
17:24:59.5 <b>HOT-1</b>	no. oh I don't— no no. *.		
17:25:01.3 <b>HOT-2</b>	okay.		
17:25:03.0 <b>HOT-1</b>	it's not even painting anything.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:25:05.0 <b>HOT-2</b>	okay.		
17:25:05.1 <b>HOT-1</b>	it's— when we get— it's the bigger one.		
17:25:07.8 <b>HOT-2</b>	the big one yeah yeah. right there.		
17:25:09.6 <b>HOT-1</b>	this one back here is what I'm worried about.		
17:25:12.2 <b>HOT-2</b>	yeah.		
17:25:12.6 <b>HOT-1</b>	I mean this hole * through so—		
17:25:15.9 <b>HOT-2</b>	right.		
17:25:31.9 <b>HOT-1</b>	I'll find out—I'll make sure they're seated.		
17:25:38.6 <b>HOT</b>	[sound of two clicks]		
17:25:39.5 <b>INT-4</b>	this is @ **.		
17:25:40.5 <b>INT-1</b>	did ** get seated?		
17:25:41.3 <b>INT-?</b>	* yeah we *.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:25:42.5 <b>INT-?</b>	two— two of us are.		
17:25:43.4 <b>INT-1</b>	okay good.		
17:25:44.4 <b>INT-1</b>	thank—.		
17:25:44.5 <b>INT-?</b>	she's— she's on her way.		
17:25:45.3 <b>INT-1</b>	she's on her way. thanks.		
17:25:46.5 <b>INT-?</b>	kay.		
17:25:46.8 <b>INT-?</b>	kay.		
17:25:47.7 <b>HOT-1</b>	they're seated so—.		
17:25:49.5 <b>HOT-2</b>	sweet.		
		17:25:57.2 <b>ZDC-B</b>	Southwest three forty five twenty miles in front of you he says between here and KORRY looks good.
		17:26:03.2 <b>RDO-1</b>	thank you.
17:26:40.2 <b>HOT-1</b>	two nine eight six still.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:26:49.9 <b>HOT-2</b>	alright ready for descent check.		
17:26:52.9 <b>HOT-1</b>	altim—...and bugs? **. [stepped on by ATC transmission to other aircraft]		
17:26:55.2 <b>HOT-2</b>	set and crosschecked.		
17:26:56.2 <b>HOT-1</b>	V ref and target?		
17:26:57.4 <b>HOT-2</b>	twenty eight and thirty four. set and noted.		
17:27:04.0 <b>HOT-1</b>	autobrake?		
17:27:04.9 <b>HOT-2</b>	three.		
17:27:05.5 <b>HOT-1</b>	packs?		
17:27:06.3 <b>HOT-2</b>	are auto.		
17:27:07.4 <b>HOT-1</b>	start switches?		
17:27:08.0 <b>HOT-2</b>	left continuous.		
17:27:08.7 <b>HOT-1</b>	annnd the recall?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:27:10.5 <b>HOT-2</b>	clear.		
17:27:11.2 <b>HOT-1</b>	checklist complete.		
17:27:11.9 <b>HOT-2</b>	good thank you.		
17:29:00.5 <b>HOT-1</b>	so if you want to cheat there.		
17:29:03.7 <b>HOT-2</b>	okay it's looking like it's going pretty good right now.		
17:29:06.2 <b>HOT-1</b>	I would say that's okay. we'll that's takes you a little farther away at— at that KORRY spot.		
17:29:08.6 <b>HOT-2</b>	right...okay.		
17:29:11.0 <b>HOT-1</b>	so if you want to do that that's fine...we just won't say nothing.		
17:29:14.4 <b>HOT-2</b>	say nothing yeah.		
17:29:23.2 <b>HOT-2</b>	feint just a hair.		
17:29:27.1 <b>HOT-2</b>	shoot the gap here.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		17:29:30.0 <b>ZDC-B</b>	Southwest three four five contact New York Approach one two seven point three.
		17:29:33.6 <b>RDO-1</b>	one two seven point three Southwest three forty five. good day.
		17:29:36.1 <b>ZDC-B</b>	—day ma'am.
		17:29:43.5 <b>RDO-1</b>	approach Southwest three forty five uh thirteen thousand two hundred descending via the KORRY Three and we've got zulu.
		17:29:49.3 <b>NYC</b>	Southwest three forty five moderate turbulence reported by the uh..previous seven three sevens about twenty in front of you. he was zig zagging a little bit but he's getting back on course now.
		17:29:59.1 <b>RDO-1</b>	okay we'd like to go about uh five to the uh left for the weather Southwest three forty five.
		17:30:04.0 <b>NYC</b>	approved as requested ma'am.
		17:30:05.4 <b>RDO-1</b>	thank you.
17:30:06.2 <b>HOT-1</b>	so you can do a little bit more if you want.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:30:36.8 <b>HOT-1</b>	yeah looks like you're going to have to stay on this to pass Robbinsville— Robbinsville or whatever it's called.		
17:30:41.4 <b>HOT-2</b>	* you want to go around that way? ***. [stepped on by ATC transmission to other aircraft]		
17:30:43.8 <b>HOT-1</b>	well.		
17:30:45.5 <b>HOT-2</b>	gonna zig— zig zag back in?		
17:30:48.3 <b>HOT-1</b>	I don't know if he's gonna let us. we'll have to ask.		
17:30:49.7 <b>HOT-2</b>	yeah okay.		
17:30:51.2 <b>HOT-1</b>	let's get past this first one first.		
17:30:52.1 <b>HOT-2</b>	first one yeah uh-huh. [sound of laughter] one at a time.		
		17:30:55.2 <b>NYC</b>	Southwest three forty five when your closer to Robbinsville if you have to uh if you have to move around weather I'd choose you to go to the left more I— rather than the right. just let me know if you can do that.
		17:31:04.6 <b>RDO-1</b>	okay um left of the— the right is better but uh we'll see if we can go to the uh the uh um excuse me the right is better but we'll go see if we can go to the left. Southwest three forty five.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:31:05.9 <b>HOT</b>	[sound similar to altitude alert]		
		17:31:15.2 <b>NYC</b>	okay like I said you have better weather than me. just let me know. if not not a big deal I can work it out.
		17:31:19.0 <b>RDO-1</b>	okay.
17:31:20.4 <b>HOT-1</b>	I don't know. I mean at this point I— I think we're sh— we're sh—. I don't know what's going to be better than the other.		
17:31:26.7 <b>HOT-2</b>	right.		
17:31:34.3 <b>HOT-1</b>	I want to see if I can kick it up. see what's upstairs of it.		
17:31:42.4 <b>CAM</b>	[sound of click]		
17:31:47.1 <b>HOT-2</b>	continuous okay.		
17:31:56.9 <b>HOT-1</b>	see it's saying to go this way.		
17:31:58.7 <b>HOT-2</b>	yeah. but yeah you're right there.		
17:32:00.5 <b>HOT-1</b>	but I can't— I can't figure out what that means.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:32:02.5 <b>HOT-2</b>	yeah that looks worse than this. than just going—		
17:32:06.3 <b>HOT-1</b>	yeah.		
		17:32:07.0 <b>NYC</b>	Southwest three forty five squawk one one three two.
17:32:07.3 <b>HOT-2</b>	straight ahead.		
		17:32:010.0 <b>RDO-1</b>	one one three two Southwest three forty five. At this time we'll continue on this heading.
		17:32:14.3 <b>NYC</b>	okay thank you.
17:32:20.0 <b>HOT-1</b>	yeah 'cause I got it pretty high now and it's not showing anything too much above.		
17:32:23.1 <b>HOT-2</b>	above right okay.		
17:32:24.6 <b>HOT-1</b>	everybody's seated.		
17:32:26.7 <b>HOT-2</b>	yeah.		
17:32:28.6 <b>HOT-2</b>	I think we're okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:32:29.4 <b>HOT-1</b>	just from a visual standpoint it looks like it should be better this way.		
17:32:30.7 <b>HOT-2</b>	standpoint yeah...this way yeah.		
17:32:34.3 <b>HOT-1</b>	and then we'll try to go to TYKES when we can.		
17:32:36.1 <b>HOT-2</b>	can yeah. sounds good.		
17:32:45.1 <b>HOT-2</b>	we'll find out. we're committed now. [sound of laughter]		
17:32:47.6 <b>HOT-1</b>	yeah.		
17:33:03.7 <b>HOT-1</b>	getting a blow off from something.		
17:33:05.2 <b>CAM</b>	[sound similar to precipitation]		
17:33:18.0 <b>HOT-1</b>	now let's go towards TYKES now.		
17:33:22.2 <b>HOT-1</b>	***. [stepped on by ATC transmissions]		
17:33:42.9 <b>HOT-2</b>	**.		
		17:33:43.1 <b>NYC</b>	Southwest three forty five how's your ride there?

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		17:33:45.5 <b>RDO-1</b>	uh so far we just uh— we got uh— we do have uh weather some rain and uh just a little bit of uh light chop. we're heading back toward TYKES now.
17:33:56.5 <b>HOT-1</b>	I don't know if that was a good idea so you want to stop for a sec?		
		17:33:58.4 <b>NYC</b>	Southwest three forty five thank you. when able direct GRENE intercept the localizer descend to seven thousand.
		17:34:04.2 <b>RDO-1</b>	okay direct GRENE when we can and seven thousand Southwest three forty five.
17:34:08.8 <b>HOT-1</b>	uhhhhhh *. [stepped on by ATC]		
17:34:10.6 <b>HOT-2</b>	seven thousand.		
17:34:14.1 <b>HOT-1</b>	okay GRENE. let's do that. that's a much better line.		
17:34:15.7 <b>HOT-2</b>	GRENE okay.		
17:34:18.8 <b>HOT-2</b>	LNAV.		
17:34:22.4 <b>HOT-2</b>	seven thousand.		

<b>Time and Source</b>	<b>Intra-Aircraft Communication</b>	<b>Time and Source</b>	<b>Over-the-Air Communication</b>
17:34:22.7 <b>HOT-1</b>	out of ten thousand they're all seated.		
17:34:24.2 <b>HOT-2</b>	yup.		
17:34:26.4 <b>HOT-1</b>	so watch your speed just a little bit.		
17:34:28.4 <b>HOT-2</b>	okay. yup.		
17:34:32.3 <b>HOT-1</b>	where you goin?		
17:34:33.5 <b>HOT-2</b>	uh		
17:34:33.7 <b>HOT-1</b>	it's turning.		
17:34:33.7 <b>HOT-2</b>	why's it doing that?		
17:34:35.1 <b>HOT-1</b>	I don't know but let's go heading.		
17:34:35.9 <b>HOT-2</b>	heading set yeah.		
17:34:37.3 <b>HOT-1</b>	I don't know where it's going.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:34:38.8 <b>HOT-2</b>	oh it's trying to reintercept the course it— it looks like. Let me go GRENE GRENE execute. just need to execute it there. Alright there we go. LNAV. there we go.		
17:34:48.4 <b>HOT-1</b>	well now we're not where I wanted to be though.		
17:35:15.0 <b>HOT-1</b>	okay when we're coming on to the approach so please don't be too fast.		
17:35:21.8 <b>HOT-2</b>	alright.		
17:35:24.7 <b>HOT-1</b>	GRENE's um...just about eleven miles out.		
17:35:28.7 <b>HOT-2</b>	okay perfect.		
17:35:34.6 <b>HOT-1</b>	temperature looks good.		
17:35:39.6 <b>HOT-2</b>	okay go to flight you think for all the rain?		
17:35:42.2 <b>HOT-1</b>	sure that's fine.		
17:36:02.6 <b>HOT</b>	[sound similar to altitude alert]		
17:36:09.0 <b>HOT-2</b>	you think we can keep getting on down.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:36:14.0 <b>HOT-1</b>	uh I doubt it.		
17:36:15.1 <b>HOT-2</b>	okay.		
17:36:16.1 <b>HOT-1</b>	[sound of laughter]		
17:36:16.3 <b>HOT-2</b>	uh uh he's not gonna—		
17:36:17.9 <b>HOT-1</b>	we'll find out though.		
17:36:18.8 <b>HOT-2</b>	okay.		
17:36:22.3 <b>HOT-1</b>	but I would definitely slow us up.		
17:36:24.1 <b>HOT-2</b>	yup.		
		17:36:33.9 <b>RDO-1</b>	any chance for lower? South— Southwest three forty five.
		17:36:37.0 <b>NYC</b>	uhhh yeah Southwest three forty five descend and maintain three thousand.
		17:36:40.6 <b>RDO-1</b>	three thousand for Southwest three forty five.
17:36:42.7 <b>HOT-1</b>	there you go.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:36:42.9 <b>HOT-2</b>	alright thank you. Level change.		
17:36:46.6 <b>HOT-2</b>	three thousand.		
17:36:50.4 <b>HOT-1</b>	it's gonna try to get your speed first.		
17:36:53.4 <b>HOT-2</b>	yeah uhhh...bring it up to two *. [stepped on]		
17:37:00.9 <b>HOT-1</b>	easiest is vertical speed.		
17:37:03.2 <b>HOT-2</b>	okay.		
17:37:03.5 <b>HOT-1</b>	and then use this to get on the speed you want and then go back to it.		
17:37:06.6 <b>HOT-2</b>	okay.		
17:37:07.1 <b>HOT-1</b>	then you know you're descending at the same time.		
17:37:17.1 <b>HOT-1</b>	and then just put that wherever you want it.		
17:37:19.3 <b>HOT-2</b>	yeah alright here we go.		
17:37:26.2 <b>HOT-1</b>	'cause I see some uh nicer weather down here.		

<b>Time and Source</b>	<b>Intra-Aircraft Communication</b>	<b>Time and Source</b>	<b>Over-the-Air Communication</b>
17:37:28.8 <b>HOT-2</b>	yes.		
17:37:29.8 <b>HOT-1</b>	[sound of laughter]		
		17:38:02.3 <b>NYC</b>	United twelve fifty nine New York?
17:38:12.1 <b>HOT-1</b>	I gather he's not.		
		17:38:19.7 <b>NYC</b>	Southwest three forty five eleven from GRENE. cross GRENE at twenty seven hundred. cleared ILS runway four approach.
		17:38:24.8 <b>RDO-1</b>	GRENE at twenty seven hundred. cleared for the ILS for four Southwest three forty five.
17:38:28.8 <b>HOT-2</b>	twenty seven hundred. GRENE. cleared the ILS.		
17:38:38.6 <b>HOT-2</b>	do doo do do do got alright eight miles from GRENE— nine miles or so it's doing pretty good.		
17:38:45.1 <b>HOT</b>	[sound similar to altitude alert]		
17:38:47.0 <b>HOT-1</b>	thirty five twenty seven.		
17:38:48.3 <b>HOT-2</b>	twenty seven alright.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:38:59.7 <b>HOT-1</b>	well I think most of that is just all—		
17:39:04.6 <b>HOT-1</b>	airport's in the clear.		
17:39:05.8 <b>HOT-2</b>	clear okay yup. you bet.		
17:39:17.0 <b>HOT-2</b>	there we should start slowing on down good.		
17:39:27.2 <b>HOT-2</b>	GRENE's about five miles and about five miles to the FAF. okay so ten miles out about.		
17:39:32.2 <b>HOT-1</b>	and you're identified.		
17:39:50.1 <b>HOT-2</b>	alright we're on altitude hold. I'll set this up for the next one.		
17:39:55.3 <b>HOT-1</b>	okay.		
17:40:07.9 <b>HOT-2</b>	mostly tail. I was hoping it was gonna switch on here.		
17:40:12.0 <b>HOT-2</b>	what's that?		
17:40:12.8 <b>HOT-1</b>	you must say it's a tailwind right now.		
17:40:14.8 <b>HOT-2</b>	yeah huh.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:40:16.7 <b>HOT-1</b>	just to let you know.		
17:40:23.7 <b>HOT-1</b>	you can just go back to continuous. I can't— that glare— can't even see it.		
		17:40:30.6 <b>NYC</b>	Southwest three forty five how's the ride been the last ten miles or so?
		17:40:33.5 <b>RDO-1</b>	nice and smooth Southwest three forty five.
		17:40:35.7 <b>NYC</b>	very good. tower's eighteen seven have a good night.
		17:40:37.5 <b>RDO-1</b>	eighteen seven thanks see ya.
17:40:41.0 <b>HOT-1</b>	* ummm. six seven.		
		17:40:46.0 <b>RDO-1</b>	tower Southwest three forty five on the ILS four.
		17:40:50.8 <b>TWR</b>	Southwest three forty five LaGuardia Tower. number two clear to land runway four. winds zero seven zero at six.
		17:40:55.2 <b>RDO-1</b>	okay number two clear to land Southwest uh three forty five.
17:40:59.1 <b>HOT-2</b>	alright clear to land.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:41:00.1 <b>HOT-1</b>	seventeen.		
17:41:01.3 <b>HOT-2</b>	—teen.		
17:41:01.9 <b>HOT-1</b>	okay.		
17:41:05.4 <b>HOT</b>	[sound similar to altitude alert]		
17:41:07.0 <b>HOT-2</b>	see four two and two. start uh dirtying it up here a little bit.		
17:41:010.0 <b>HOT-1</b>	I agree.		
17:41:10.7 <b>HOT-2</b>	let's go flaps five please.		
17:41:11.5 <b>HOT-1</b>	five.		
17:41:12.6 <b>CAM</b>	[sound similar to flap handle movement]		
17:41:15.4 <b>HOT-1</b>	remember you're on that so it's going to try to maintain that speed first and not go down.		
17:41:19.4 <b>CAM</b>	[sound similar to trim]		
17:41:20.7 <b>HOT-2</b>	okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:41:25.2 <b>CAM</b>	[sound similar to trim]		
17:41:25.5 <b>HOT-2</b>	still above the glideslope here so.		
17:41:27.7 <b>HOT-1</b>	okay.		
17:41:29.1 <b>HOT-2</b>	arm the approach mode here and we should just—		
17:41:31.4 <b>HOT-1</b>	that works *.		
17:41:31.8 <b>HOT-2</b>	come on down and—		
17:41:32.9 <b>HOT-1</b>	[sound of laughter]		
17:41:34.6 <b>HOT-2</b>	*.		
17:41:35.5 <b>CAM</b>	[sound similar to trim]		
17:41:36.4 <b>HOT-2</b>	alright let's go landing gear down please.		
17:41:38.1 <b>HOT-1</b>	landing gear down.		
17:41:38.9 <b>CAM</b>	[sound similar to landing gear handle movement]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:41:39.0 <b>CAM</b>	[sound similar to trim]		
17:41:39.5 <b>CAM</b>	[sound of increased air noise]		
17:41:45.6 <b>HOT-2</b>	and flaps fifteen.		
17:41:50.0 <b>HOT-1</b>	down flaps fifteen.		
17:41:52.0 <b>CAM</b>	[sound similar to flap handle movement]		
17:41:59.3 <b>CAM</b>	[sound similar to trim]		
17:42:00.5 <b>HOT-1</b>	okay localizer glideslope is captured. zeros.		
17:42:02.2 <b>HOT-2</b>	captured. here we go.		
17:42:04.4 <b>CAM</b>	[sound similar to trim]		
17:42:07.1 <b>HOT-1</b>	still showing you a tail.		
17:42:20.4 <b>HOT-1</b>	were we DNNIS seventeen?		
17:42:22.6 <b>HOT-2</b>	—teen yup.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:42:23.3 <b>HOT-1</b>	got that okay.		
17:42:24.2 <b>HOT-1</b>	okay.		
17:42:24.4 <b>CAM</b>	[sound similar to trim]		
17:42:25.7 <b>HOT-2</b>	thirty.		
17:42:26.6 <b>HOT-1</b>	want to go twenty five?		
17:42:28.1 <b>HOT-2</b>	sure.		
17:42:29.4 <b>HOT-1</b>	see if we can't get it to come down. what's our— uh thirty four.		
17:42:33.1 <b>CAM</b>	[sound similar to flap handle movement]		
17:42:37.1 <b>HOT-1</b>	now we'll go thirty.		
17:42:37.5 <b>CAM</b>	[sound similar to flap handle movement]		
17:42:39.4 <b>HOT-2</b>	alright. before landing.		
17:42:40.2 <b>CAM</b>	[sound of click]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:42:41.1 <b>HOT-1</b>	speed brake?		
17:42:42.2 <b>HOT-2</b>	armed green light.		
17:42:42.8 <b>HOT-1</b>	landing gear?		
17:42:43.7 <b>HOT-2</b>	down three green.		
17:42:44.3 <b>HOT-1</b>	and the flaps?		
17:42:45.1 <b>HOT-2</b>	thirty green light.		
17:42:45.9 <b>HOT-1</b>	before landing checklist is complete. you are clear to land on that runway right over there.		
17:42:50.1 <b>HOT-2</b>	right on.		
17:42:52.9 <b>HOT-1</b>	I'm gonna get rid of the weather.		
17:42:55.6 <b>CAM</b>	[sound similar to trim]		
17:42:57.9 <b>HOT-2</b>	there's a thousand feet. one thirty—		
17:42:58.8 <b>HOT-1</b>	weather.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:42:59.7 <b>HOT-2</b>	what's that? okay.		
17:43:01.4 <b>HOT-1</b>	there you go.		
17:43:02.0 <b>HOT-2</b>	yeah.		
17:43:02.4 <b>HOT-1</b>	otherwise it's going to start making noises.		
17:43:02.7 <b>CAM</b>	[sound similar to trim]		
17:43:03.8 <b>HOT-2</b>	okay thousand feet. uh thirty six and sinking six hundred.		
17:43:06.7 <b>HOT-1</b>	thousand feet.		
17:43:11.4 <b>CAM</b>	[sound similar to trim]		
17:43:30.2 <b>HOT-1</b>	oh we're forty.		
17:43:31.5 <b>HOT-2</b>	oh there you go.		
17:43:32.1 <b>CAM</b>	[sound similar to flap handle movement]		
17:43:34.2 <b>HOT-1</b>	that was like an hour and a half ago that we briefed that. I'm sorry.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:43:36.8 <b>HOT-2</b>	[sound of laughter]		
17:43:37.1 <b>HOT-1</b>	all the sudden I started looking at that runway going 'something's wrong.'		
17:43:39.8 <b>HOT-2</b>	okay.		
17:43:40.4 <b>HOT-1</b>	okay flaps are at forty.		
17:43:41.7 <b>HOT-2</b>	forty we got it. green light.		
17:43:42.9 <b>HOT-1</b>	green light.		
17:43:43.3 <b>CAM</b>	[sound similar to trim]		
17:43:45.1 <b>HOT-2</b>	alright.		
17:43:45.7 <b>HOT-1</b>	five hundred.		
17:43:48.4 <b>CAM</b>	[sound similar to trim]		
17:43:49.6 <b>CAM</b>	[sound similar to autopilot disconnect]		
17:43:52.4 <b>HOT-1</b>	people are crossing. they're out of your way.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:44:00.5 <b>HOT-1</b>	clear to land.		
17:44:07.6 <b>HOT-1</b>	correcting nicely. don't get too much on the speed.		
17:44:12.2 <b>HOT-1</b>	ooh.		
17:44:12.9 <b>HOT-2</b>	uhh come on.		
17:44:14.4 <b>HOT-1</b>	one hundred.		
17:44:15.8 <b>HOT-1</b>	gotta get *. **.		
17:44:17.7 <b>HOT-1</b>	get down. get down. get down.		
17:44:20.6 <b>HOT-1</b>	get down.		
17:44:23.0 <b>HOT-1</b>	I got it.		
17:44:23.6 <b>HOT-2</b>	okay you got it.		
17:44:26.0 <b>HOT-1</b>	[sound similar to inhalation] #.		
17:44:26.8 <b>CAM</b>	[sound of impact]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
17:44:26.9 <b>CAM</b>	[sound of scraping]		
17:44:45.3 <b>CAM</b>	[sound of scraping stops]		
17:44:45.5 <b>CAM-1</b>	oh my God.		
17:44:46.3 <b>CAM-?</b>	you guys okay?		
17:44:46.9 <b>CAM-1</b>	sorry.		
17:44:47.7 <b>CAM-1</b>	yes *.		
17:44:48.5 <b>CAM-?</b>	you guys okay?		
17:44:49.3 <b>CAM-1</b>	remain seated.		
17:44:49.6 <b>CAM</b>	[sounds of movement in cockpit]		
17:44:52.9 <b>CAM-1</b>	we need to shut this down.		
17:44:56.0 <b>END OF TRANSCRIPT</b> <b>END OF RECORDING</b>			