

National Transportation Safety Board

Office of Research and Engineering

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COCKPIT VOICE RECORDER

Group Chair's Factual Report

July 18, 2023

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.

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A. ACCIDENT

Location: Batesville, Arkansas
Date: November 29, 2022
Time: 1910 Central Standard Time (CST)
Airplane: Learjet 45, N988MC

B. COCKPIT VOICE RECORDER GROUP

Group Chair	Charles Cates Mechanical Engineer/Recorder Specialist National Transportation Safety Board (NTSB)
IIC	Mike Folkerts Air Safety Investigator NTSB
Party Coordinator	Todd Gentry Air Safety Investigator Federal Aviation Administration
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C. FEDERAL CARRIAGE REQUIREMENTS

The event aircraft, N988MC, was operating as Title 14 *Code of Federal Regulations* (CFR) Part 91. The event aircraft was manufactured in 2007 and was operating such that it was required to be equipped with a cockpit voice recorder (CVR) that records a minimum of the last 30 minutes of aircraft operation. The aircraft was not equipped with a FDR, nor was one required.

D. DETAILS OF THE INVESTIGATION

A CVR group was convened on 3/21/2023. The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model: Honeywell 6020
Part Number: 980-6020-011
Recorder Serial Number: CVR30-04239

1.0 Recorder Description

This model CVR, the Honeywell 6020, records a minimum of 30 minutes of digital audio stored on solid state memory modules. Four channels are recorded: 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 CVR had not sustained any heat or structural damage and the audio information was extracted from the recorder normally, without difficulty.

1.2 Audio Recording Description

Each channel's audio quality is indicated in Table 1.¹ Channel number one did not contain any audio information (nor was it required by federal regulations).

Table 1: Audio Quality

Channel Number	Content/Source	Quality	Duration
1	None	N/A	30 min
2	First Officer	Excellent	30 min
3	Captain	Excellent	30 min
4	CAM	Good	30 min

1.3 Timing and Correlation

Timing on the transcript was established by correlating the CVR events to common events on the aircraft Enhanced Ground Proximity Warning System (EGPWS). Specifically, the "TOO LOW TERRAIN" callout and the time of aircraft touchdown were used along with available video evidence as an anchor to the local central standard time (CST). The CVR events were offset to reflect the local CST of the accident.

¹ Appendix A comprises the CVR Quality Rating Scale

1.4 Description of Audio Events

The recording and transcript began at 1840:40 with the aircraft descending from cruise altitude. At 1853:10 the crew requested the RNAV approach for Batesville Airport runway 8 and were gradually cleared down to the airport. At 1905:41 the captain said they would probably be landing about 450 pounds overweight.

The autopilot was disconnected at 1908:54. About 18 seconds later, the captain, who was the pilot flying, said "my goodness dude slow down" and then called for flaps 20.

At 1910:08, the captain said, "man dude, disregard this." There was then a sound of a clunk similar to a movement of the spoiler handle followed by a brief 0.06 second beep recorded at 1025 Hertz (Hz). The aircraft warning chime is a 1025 Hz chime and according to Bombardier, movement of the spoiler handle in this phase of flight would cause an aircraft warning.

At 1910:23 the copilot said "still really fast" and the captain responded "sh'yeah." The automated MINIMUMS callout was annunciated at 1910:24, and at 1910:30 an EGPWS TOO LOW TERRAIN callout was audible. According to Honeywell, the TOO LOW TERRAIN callout is only annunciated if the aircraft is not configured properly for landing.

Sound consistent with main gear touchdown was audible at 1910:43. Shortly after touchdown the copilot said "...uhh that's the end of the runway" to which the captain responded, "that- that is right there?" Sound of increased rumbling noise consistent with runway departure occurred at 1910:52 and a decrease in overall background noise consistent with the aircraft coming to a rest occurred at 1911:04. The recording ended shortly thereafter at 1911:55.

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. They have not responded to the invitation.

Submitted by:

Charles Cates
Mechanical 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 Honeywell 6020 solid state cockpit voice recorder, serial number CVR30-04239, installed on a Learjet 45, registration number N988MC, which experienced a runway overrun on November 29, 2022 at Batesville Regional Airport in Batesville, Arkansas.

LEGEND

ASOS	Automated Surface Observing System
CAM	Cockpit area microphone voice or sound source
CTAF	Common Traffic Advisory Frequency
GPWS	Aircraft Enhanced Ground Proximity Warning System
HOT	Flight crew audio panel voice or sound source
KCC	Radio transmission from Kansas City center controller
MEM	Radio transmission from Memphis center controller
RDO	Radio transmissions from N988MC
-1	Voice identified as the pilot
-2	Voice identified as the copilot
-?	Voice unidentified
*	Unintelligible word
()	Questionable insertion
[]	Editorial insertion

Note 1: Times are expressed in central standard 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.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
1840:40.8	START OF RECORDING START OF TRANSCRIPT		
18:41:45.2	HOT-2	I don't know I think we might be just on the edge of it. I think it's a little bit further.	
18:42:24.7	HOT-2	oh that's bright.	
18:44:23.9	HOT-1	what's uh- what's- did you set the baro? seven ten?	
18:44:27.3	HOT-2	seven ten yeah.	
18:44:28.2	HOT-1	gotcha.	
18:44:42.2	HOT-2	yup. seven ten. your approach course is gonna be zero seven nine. you got six thousand feet of runway. airport elevation is four sixty five. your missed approach you're gonna climb three thousand direct NAPIC and hold. uh twenty nine hundred foot M-S-A. your FAF is NICIN at two thousand four hundred minimums at seven thirteen.	
18:45:05.2	HOT-1	alrighty thank you sir.	
18:45:16.3	CAM	[sound similar to click]	

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:45:17.4 HOT-2	yep I don't think we're gonna make it to the storms.	18:45:50.8 MEM	dark horse three contact Kansas City center one three two point six five g'night.
		18:45:55.3 RDO-2	one three two six five dark horse three have a good night.
18:46:02.9 CAM	[single chime similar to altitude alert]		
18:46:04.9 HOT-1	one to go.	18:46:09.4 RDO-2	and Kansas City dark horse three is with you descending through thirty seven seven for three seven zero.
		18:46:15.1 KCC	dark horse three Kansas City center roger descend and maintain flight level three six zero.
		18:46:19.4 RDO-2	down to three six zero dark horse three.
18:46:24.6 HOT-1	see it.		
18:46:25.2 HOT-2	thirty six.		
18:46:44.8 CAM	[single chime similar to altitude alert]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:46:45.7 HOT-1	one to go.		
18:46:46.2 HOT-2	one to go.		
18:47:07.2 HOT-2	once we- once we land and start taxiing off do you want me to go ahead and give Memphis a call?		
18:47:11.5 HOT-1	yeah.		
18:47:12.0 HOT-2	and pick up our clearance.		
18:47:13.6 HOT-1	yeah.		
18:47:15.1 HOT-2	I wonder if can I cancel with them on the ground and then pick it back up?		
18:47:17.5 HOT-1	probably.		
18:47:18.5 HOT-1	I was gonna say yeah if we have to call again you can probably pick it up when you cancel.		
18:47:21.9 HOT-2	okay. cause I called flight service to cancel and then center to pick it up.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:47:25.7 HOT-1	oh yeah. yeah. no they yeah. can't. so the number's to flight service its not to center. ask center when we land if there's a number we can call besides-		
18:47:35.3 HOT-2	well- well so I've called center to pick it up so center answered too- the first time I called center to cancel and they didn't answer so I called flight service.		
18:47:41.9 HOT-1	oh ok.		
18:47:42.8 HOT-2	and dude its like a ten minute thing...		
18:47:44.5 HOT-1	oh yeah.		
18:47:45.0 HOT-2	...to step through robot voices until you finally talk to somebody.		
		18:48:04.6 KCC	dark horse three descend and maintain flight level three three zero.
18:48:06.0 HOT-1	there it is. [spoken during call from KCC]		
		18:48:09.4 RDO-2	down to three three zero dark horse three.
18:48:14.7 HOT-1	I see thirty three.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:48:16.3 HOT-2	thirty three.		
18:48:23.7 HOT-2	what did you slow down for?		
18:48:25.7 HOT-1	make it smooth.		
18:48:26.5 HOT-2	is there a reason? smooth?		
18:48:27.5 HOT-1	yeah.		
18:48:43.6 HOT-2	its quite the show.		
18:49:01.4 HOT-2	I don't think you're even gonna be able to pick that up.		
18:49:05.2 HOT-2	no its not even gonna- [sound of sigh]		
18:50:08.5 HOT-1	I don't know why they don't just give us lower. gonna slooow down as I can so we don't have to level out.		
18:50:25.1 CAM	[single chime similar to altitude alert]		
18:50:27.7 HOT-2	one to go.		
18:51:22.1 HOT-1	[sound of sigh] well...		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:51:25.4 HOT-2	I guess she's gonna make you slow down or make you uh level out.		
18:51:29.2 HOT-1	yeah.		
		18:51:39.0 KCC	attention all aircraft hazardous weather information convective SIGMET one for Tennessee Kentucky Alabama Mississippi Louisiana Arkansas and Texas. and center weather advisory two zero one for the Little Rock area more available on HIWAS flight watch flight service.
18:51:55.9 HOT-2	I mean there's no one over here. maybe this guy?		
18:52:14.5 HOT-2	you want me to tell her-		
		18:52:15.3 KCC	dark horse three contact Memphis center on one three two point three seven.
		18:52:19.9 RDO-2	one three two three seven dark horse three.
		18:52:38.1 MEM-A	dark horse three Memphis.
		18:52:39.4 RDO-2	center dark horse three is with you three three zero.
		18:52:43.0 MEM-A	dark horse three Memphis center roger I'll have lower for ya here in just a minute.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		18:52:46.2 RDO-2	roger. dark horse three.
		18:52:47.6 MEM-A	you do have a guy sittin' under you uh at three zero zero off your left there about five miles if you want a vector or somethin' let me know but otherwise it'd be * just a * sec.
		18:52:56.1 RDO-2	uh roger we've got'em in sight dark horse three.
18:52:58.4 HOT-1	tell 'em-		
18:52:59.5 HOT-2	do what?		
18:53:00.1 HOT-1	he said if we want a vector ask for direct that fix. that might help.		
18:53:04.9 HOT-2	okay. what was that.		
18:53:07.2 HOT-2	woop.		
		18:53:10.2 RDO-2	and center dark horse three I would like to (um/put on) request direct VILLO victor india lima lima oscar for the R-NAV runway eight into Batesville if that'll help get us down quicker.
		18:53:20.5 MEM-A	dark horse three roger expect that.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		18:53:29.7 MEM-A	dark horse three descend and maintain flight level three one zero.
		18:53:32.5 RDO-2	down to three one zero dark horse three.
18:53:38.7 HOT-1	I see thirty one.		
18:53:39.8 HOT-2	thirty one.		
		18:54:02.6 MEM-A	dark horse three cleared to uh HAXOD that'll be your initial approach fix um that way you don't have to do a procedure turn HAXOD expect R-NAV two six Batesville.
		18:54:11.0 RDO-2	alright direct HAXOD the R-NAV for...
18:54:12.0 HOT-1	nope. we wanted eight.		
		18:54:14.5 RDO-2	hang on what runway was that dark horse three?
		18:54:17.6 MEM-A	yeah you wanted R-NAV two six into Batesville is that correct?
18:54:19.5 HOT-1	no. eight.		
		18:54:20.5 RDO-2	no we wanted the R-NAV into eight for dark horse three.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		18:54:23.0 MEM-A	alright well in that case standby.
18:54:26.6 HOT-1	we told you what we wanted dude. quit-		
18:54:28.4 HOT-2	I don't-		
		18:54:28.6 MEM-A	* charlie india sierra oscar golf expect R-NAV eight Batesville for dark horse three.
		18:54:34.3 RDO-2	alright direct CISOG for the R-NAV eight dark horse three.
18:54:38.0 HOT-2	okay.		
18:54:38.7 HOT-1	just let us fly the plane dude. and.. and uh. nav. okay?		
18:54:39.1 CAM	[single chime similar to altitude alert]		
18:54:48.3 HOT-1	and three one zero's all we've got down to?		
18:54:51.2 HOT-2	yeah we're only down to thirty one.		
		18:55:01.6 ASOS	[ASOS heard faintly in background, obscured by other non-pertinent radio traffic]

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:55:16.7 HOT-1	what's the altitude at- ki- CISOG?	18:55:17.4 ASOS	Batesville regional airport automated weather observation zero zero five four zulu wind two three zero at zero three visibility one zero *-
18:55:23.8 HOT-2	three thousand. no that's outside * *		
18:55:31.8 HOT-2	aw well the wind's changed from calm to two three zero at three.		
		18:55:34.9 MEM-A	dark horse three descend and maintain flight level two four zero.
18:55:35.8 HOT-1	fine.		
		18:55:37.4 RDO-2	down to two four zero dark horse three.
18:55:38.9 HOT-1	stick with this plan.		
18:55:54.5 HOT-2	CISOG's at three thousand.		
18:55:58.8 HOT-2	that's a nice line.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		18:56:20.4 MEM-A	dark horse three contact Memphis one two six point eight five he has your request.
		18:56:24.7 RDO-2	one two six eight five have a good day dark horse three.
18:56:32.4 HOT-2	what request what request we've got direct CISOG.		
18:56:35.9 HOT-1	do * yeah just check in with him.		
18:56:38.0 HOT-2	okay.		
		18:56:40.5 RDO-2	and center dark horse three's with you descending through two niner five for two four zero.
		18:56:49.8 MEM-B	dark horse three roger five zero miles from CISOG cross CISOG at or above four thousand clear(ed) R-NAV runway eight approach Batesville airport.
		18:56:56.3 RDO-2	alright cross CISOG at or above four thousand cleared for the R-NAV runway eight into Batesville dark horse three.
		18:57:01.9 MEM-B	dark horse three you did have weather and NOTAMs there correct?
		18:57:04.2 RDO-2	ah correct we have the weather and NOTAMs dark horse three.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:57:07.7 HOT-1	alright four thousand?		
18:57:09.6 HOT-2	at four thousand [sound of sigh].		
18:57:24.3 HOT-2	altimeter's two niner six seven.		
		18:57:29.8 MEM-B	dark horse three your Batesville altimeter is uh two niner six seven.
		18:57:33.9 RDO-2	two niner six seven dark horse three thank you.
18:58:07.5 HOT-2	I wonder which way these storms are moving. (are they) north- probably north we- or north east-ish?		
18:58:17.6 HOT-1	can I see your uh deal I'm gonna review the plate real quick.		
18:58:20.5 HOT-2	yep.		
18:59:02.7 HOT-1	okay thank you.		
18:59:03.7 HOT-2	yup.		
		18:59:43.6 MEM-B	and dark horse three I just wanted to make sure you got cross CISOG at or above four thousand is that right?

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		18:59:48.4 RDO-2	uh roger cross CISOG at or above four thousand dark horse three.
		18:59:51.8 MEM-B	and dark horse three roger report your cancellation of I-F-R- well- actually I got some traffic now. just stay here.
		18:59:57.2 RDO-2	alright. we'll stay with you dark horse three.
18:59:59.8 HOT-2	I mean man we're at twenty one thousand feet still.		
19:00:02.1 HOT-1	yeah. little anxious there.		
19:00:48.8 HOT-2	that is one heck of a lightning storm.		
19:00:51.7 HOT-1	yeah it is. nonstop.		
19:01:16.0 HOT-2	so would you go through that if you had to?		
19:01:18.4 HOT-1	I mean not if I was crusin' but if I was uh down low and havin' to land there yeah.		
19:01:21.7 HOT-2	...havin' to come into an airport...		
19:01:26.8 HOT-2	the static wicks protect from any of that stuff don't they?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:01:29.4 HOT-1	well not really. I mean if you get struck you're gonna get struck you know they're just... but. I mean... you know I wouldn't fly through that high but-	19:01:40.6 MEM-B	dark horse three report your cancellation of I-F-R this frequency or through flight service change to advisory frequency approved.
19:01:46.1 HOT-2	you wanna just cancel here or you wanna cancel on the ground?		
19:01:47.8 HOT-1	ahh w- okay. nah no don't cancel now 'cause we're still probably I-F-R.	19:01:52.4 RDO-2	alright well we'll give a call and cancel on the ground dark horse three thank you.
		19:01:55.8 MEM-B	okay. sounds good thank you.
19:02:04.8 HOT-2	alright twenty two eight.	19:02:28.6 RDO-2	and Batesville traffic dark horse three is a LearJet we're twenty five miles northwest of the field descending through one five fifteen thousand inbound landing runway eight. Batesville.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		19:02:44.0 CTAF	[unrelated traffic on CTAF frequency at another airport, commented on by crew]
19:03:06.5 HOT-2	alright you want me to bug three thousand?		
19:03:11.8 HOT-1	uhhh yeah.		
19:03:12.9 HOT-2	* *.		
		19:05:10.9 RDO-2	Batesville traffic dark horse three is a LearJet fifteen miles northwest of the field its gonna be an extended uh left base for runway eight shooting the R-NAV in for Batesville.
19:05:39.3 HOT-1	well we're gonna be a little bit heavy aren't we.		
19:05:41.5 HOT-2	yeah.		
19:05:41.7 HOT-1	'bout four hundred pounds heavy- little bit- five hundred pounds- four hundred fifty pounds heavy.		
19:06:09.1 HOT-2	I see terminal mode. L-P-V's alive.		
19:06:13.9 HOT-1	see it.		
19:06:40.5 HOT-1	[sound similar to humming]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:07:22.5 HOT-1	and which is the FAF again?		
19:07:23.7 HOT-2	NICIN at twenty four hundred.		
19:07:26.1 HOT-1	NICIN at twenty four?		
19:07:27.5 HOT-2	yes sir.		
19:07:28.4 HOT-1	thank you sir.		
19:07:31.1 HOT-2	approach mode is available.		
19:07:34.9 HOT-2	uh yup.		
		19:08:05.5 RDO-2	[sound similar to 3 mic clicks]
19:08:09.2 HOT-2	I've got the runway.		
19:08:10.3 HOT-1	okay go ahead and see if you can cancel.		
19:08:17.4 HOT-2	you see it?		
19:08:18.2 HOT-1	no.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:08:20.9 HOT-1	oh yeah I got it now.		
19:08:21.6 CAM	[single chime similar to altitude alert]		
19:08:21.8 HOT-2	okay.		
19:08:22.4 HOT-2	turn it up.		
		19:08:25.7 RDO-2	and Memphis center dark horse three.
		19:08:27.4 MEM-B	go ahead.
		19:08:28.1 RDO-2	ah we're visual approach here we'll just go ahead and cancel with you.
		19:08:30.8 MEM-B	dark horse three roger I-F-R cancellation received squawk V-F-R change to advisory approved see ya.
		19:08:35.2 RDO-2	alright squawkin' V-F-R over to advisory have a good night dark horse three.
		19:08:42.5 RDO-2	and Batesville traffic dark horse three is a LearJet five mile final for runway eight. Batesville.
		19:08:47.2 RDO-2	[sound similar to 2 mic clicks]

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:08:48.3 HOT-2	oh.	19:08:48.8 RDO-2	[sound similar to 5 mic clicks]
19:08:53.1 HOT-2	that's a little bit brighter		
19:08:54.1 HOT-1	autopilot and yaw dampeners away it's my airplane.		
19:08:54.5 CAM	[sound similar to autopilot disengage cavalry charge]		
19:08:56.8 HOT-2	your airplane.		
19:09:12.4 HOT-1	my goodness dude slow down.		
19:09:15.8 HOT-1	alright flaps twenty.		
19:09:17.5 HOT-2	flaps eight. flaps twenty.		
19:09:19.6 HOT-1	aux hyd. gear down.		
19:09:21.0 HOT-2	aux hyd. gear's swingin'.		
19:09:22.6 CAM	[sound of clunk]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:09:24.6 CAM	[sound of click]		
19:09:24.9 CAM	[increase in background noise similar to landing gear extension]		
19:09:31.4 HOT-1	man I'm losing the runway.		
19:09:32.8 HOT-2	three green. down and locked. yeah it looks like there's a cloud layer maybe right there on top of it?		
19:09:39.3 CAM	[sound of single chime]		
19:09:49.4 HOT-2	well...		
19:09:51.8 HOT-2	it's...		
19:09:53.7 HOT-1	are you kidding me?		
19:09:54.7 HOT-2	disappearing.		
19:09:57.2 HOT-2	oh there's a whole haze layer here. I still see the PAPIs.		
19:10:03.8 HOT-2	alright I've got it still.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:10:08.4 HOT-1	man dude. disregard this.		
19:10:09.4 CAM	[sound of clunk, similar to spoiler handle movement]		
19:10:10.4 HOT	[sound of 0.06 sec beep at 1025 Hz]		
19:10:19.0 HOT-2	well...		
19:10:23.1 HOT-2	still really fast.		
19:10:24.3 HOT-1	sh'yeah.		
19:10:24.9 GPWS	minimums. minimums. [electronic voice]		
19:10:30.9 GPWS	too low. terrain. [electronic voice]		
19:10:35.2 CAM	[sound similar to engine fan speed reduction]		
19:10:37.1 GPWS	twenty. [electronic voice]		
19:10:37.9 HOT-2	oohhh...		
19:10:39.0 GPWS	ten. [electronic voice]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:10:39.6 HOT-1	here we go.		
19:10:43.2 CAM	[increase in background noise similar to gear touchdown]		
19:10:43.5 HOT-2	you're gonna need to- uhh that's the end of the runway.		
19:10:46.3 HOT-1	that- that is right there?		
19:10:47.5 CAM	[sound of click]		
19:10:48.5 HOT-1	[sound similar to heavy breathing/straining]		
19:10:48.6 HOT-2	yup.		
19:10:49.9 HOT-1	aww are you kidding me?		
19:10:50.8 CAM	[sound of click]		
19:10:51.5 HOT-1	[similar to heavy breathing/straining]		
19:10:51.6 CAM	[sound of click]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:10:51.9 CAM	[increase in rumbling background noise]		
19:10:54.9 HOT-1	I cannot believe it.		
19:10:56.1 CAM	[momentary reduction in background noise]		
19:10:56.8 CAM	[sound of impacts]		
19:10:57.2 CAM	[sound of triple chime]		
19:11:01.1 CAM	[sound of impacts]		
19:11:02.9 HOT-1	[sound of triple chime]		
19:11:04.0 CAM	[decrease in background noise]		
19:11:07.0 CAM-?	are you guys okay?		
19:11:07.4 CAM	[sound of single chime]		
19:11:09.0 CAM-?	you alright? yeah.		
19:11:14.3 CAM	[sound of single chime]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:11:15.6 CAM	[sound similar to cabin door opening]		
19:11:16.1 CAM	[sound similar to engine rpm reduction]		
19:11:26.0 CAM	[sound of single chime]		
1911:55.8 END OF TRANSCRIPT END OF RECORDING			