Docket No. SA-521

Exhibit No. 12A

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D. C.

Group Chairman's Factual Report of Investigation
Cockpit Voice Recorder

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorders Division
Washington, D.C. 20594

FACTUAL REPORT OF INVESTIGATION

DCA00MA026

by

Anna W. Cushman
Aerospace Engineer (CVR)

WARNING
The reader of this report is cautioned that the transcription of a cockpit voice recorder (CVR) tape 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 attached CVR transcript should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the transcript as the sole source of information.

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorders Division
Washington, D.C. 20594

April 24, 2001

Cockpit Voice Recorder - 12

Group Chairman's Factual Report
by Anna W. Cushman

A. ACCIDENT

Location:	Rancho Cordova, California
Date:	February 16, 2000
Time:	1951 pacific standard time (PST)*
Aircraft:	DC8-71F, N8079U
Operator:	Emery Worldwide Airlines, Flight 17
NTSB Number:	DCA00MA026

B. GROUP I – February 19, 2000

Chairman:	Anna W. Cushman Aerospace Engineer (CVR) National Transportation Safety Board
Member:	Jerry Buffington Check Airman/Instructor Emery Worldwide Airlines
Member:	John Albright DC8 Emery Worldwide Airlines Pilot Air Line Pilots Association
Member:	Nicholas A. Gentile Chief Pilot/Senior Manager Boeing Company
Member:	Victoria Anderson Air Safety Investigator Federal Aviation Administration

* All times are expressed in pacific standard time (PST), unless otherwise noted.

GROUP II – January 9, 2001

Chairman:	Anna W. Cushman Aerospace Engineer (CVR) National Transportation Safety Board
Member:	Richard Hagquist Check Airman Emery Worldwide Airlines
Member:	John Albright DC8 Emery Worldwide Airlines Pilot Air Line Pilots Association
Member:	Nicholas A. Gentile Chief Pilot/Senior Manager Boeing Company
Member:	Victoria Anderson Air Safety Investigator Federal Aviation Administration

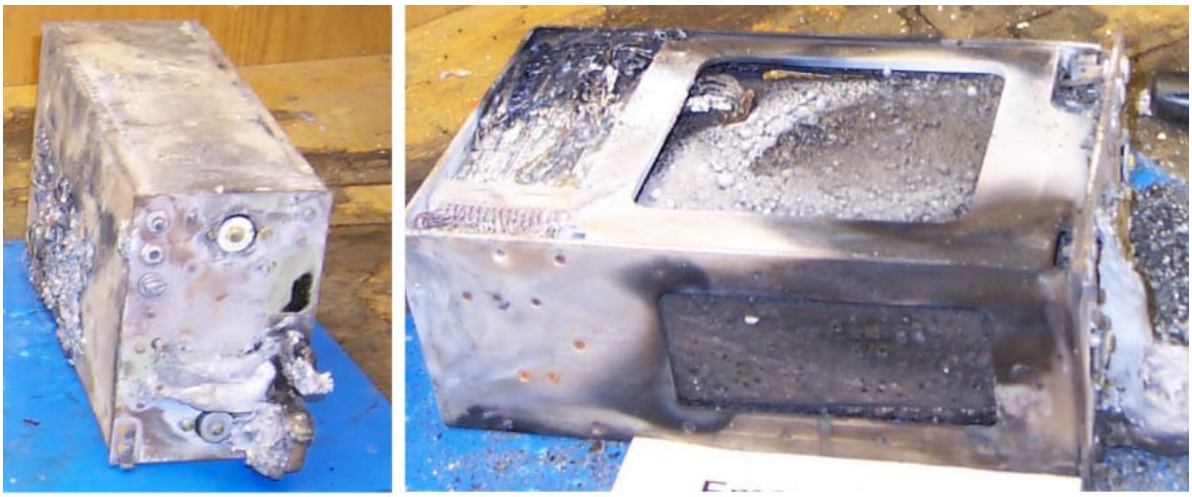
C. SUMMARY

On February 16, 2000 a DC8-71F aircraft, registration N8079U Emery flight 17, crashed after takeoff from Mather Field in Ranch Cordova, California. A Sundstrand AV557 tape cockpit voice recorder (CVR) was recovered from the wreckage and sent to the audio laboratory of the National Transportation Safety Board[*]. The CVR group meeting convened on February 19, 2000 and January 9, 2001. A transcript was prepared for the 33-minute 24-second recording.

D. DETAILS OF INVESTIGATION

Upon arrival at audio laboratory on February 18, 2000, it was evident that the CVR had been exposed to intense fire and heat. The exterior of the CVR showed severe heat damage, as shown in Figure 1a. With the outer case removed, it was apparent that the interior sections had also sustained extreme heat damage (Figure 1b). The crash-survivable case containing the tape drive assembly was extracted from the CVR and opened (Figure 2). Although the tape assembly unit did not appear to have severe heat damage, the CVR magnetic tape that was outside of the spool showed signs of shrinkage, which can be the result of CVR tape exposure to heat (Figure 3).

[*] A serial number for the CVR was not identified.



a) CVR before disassembly b) CVR with outer case removed

Figure 1: CVR heat damage.

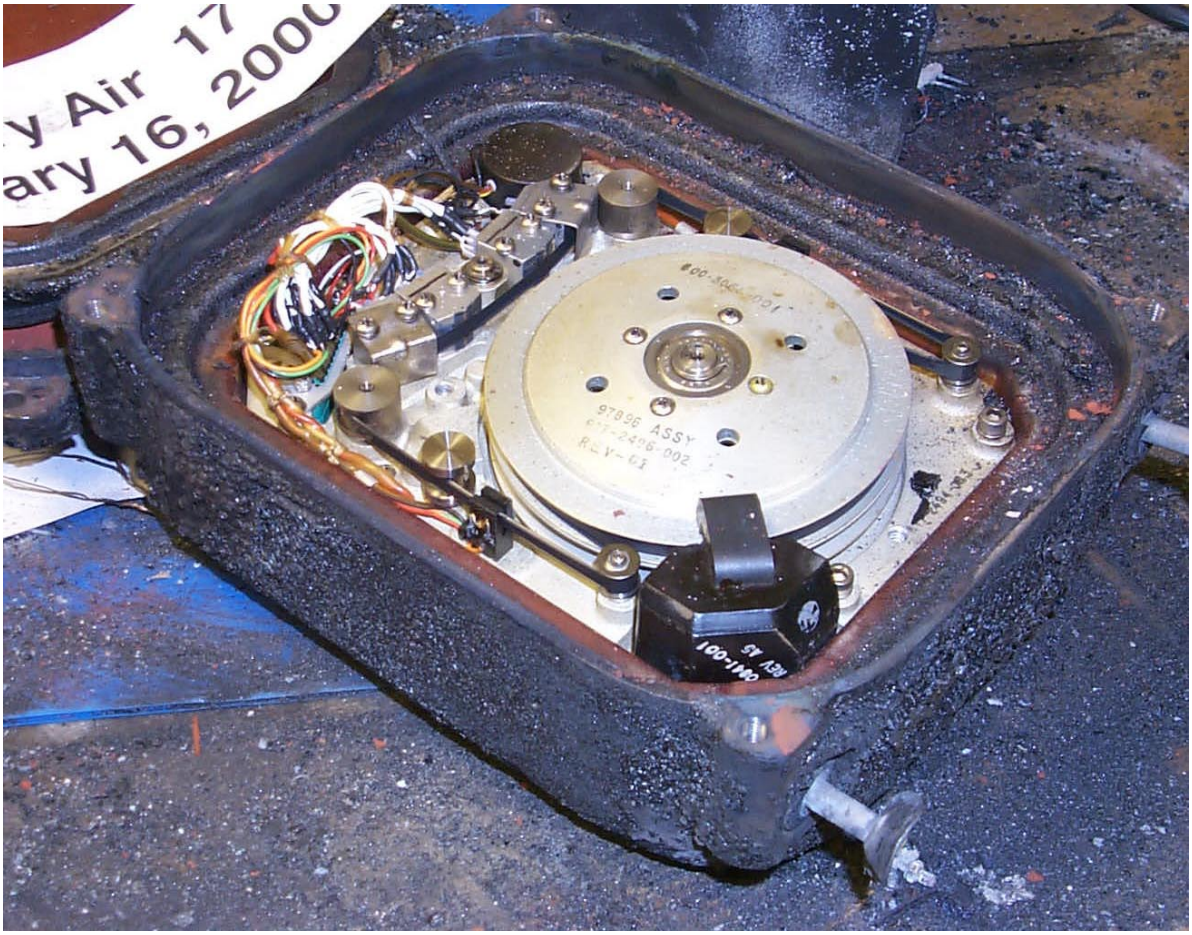


Figure 2: Tape assembly unit within crash-survivable case.

a) Left side of tape assembly

b) Right side of tape assembly

Figure 3: The CVR tape, as shown from each side of the tape assembly, had shrunk around the rollers, as a result of exposure to heat.

The sections of tape that had shrunk around the rollers sustained permanent damage, which resulted in several small areas of unusable audio at the beginning and end of the recording. Additionally, the AV557 recorder is a co-axial bi-directional recorder that records on four tracks for approximately fifteen minutes and then reverses direction and records on a second set of four tracks for fifteen minutes, yielding at least 30 minutes of recorded audio. As a result of the AV557 operation, there are two momentary interruptions in the recording when the CVR tape drive reversed direction. The overall recording, however, was in playable condition and was successfully downloaded.

The recording consisted of four channels of good quality audio information. The first channel contained the First Officer's audio panel information. The second channel contained the audio information from the cockpit area microphone (CAM). The third channel contained the Captain's audio panel information. The fourth channel contained the Second Officer's audio panel information.

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, the last five radio transmissions that the aircraft made were correlated to the VHF microphone key parameter from the FDR. Each of the five radio transmissions acted as an anchor point

for a linear interpolation between the remaining CVR events. Once a correlation between the two recorders was established, a reference to local time was determined. Using a partial transcript from the FAA air traffic control facility in Sacramento, the UTC time of the final radio transmission from the accident aircraft was linked to the corresponding CVR event. The CVR and FDR times were offset to reflect the local pacific standard time of the accident.

The recording began at 1917:45 as the aircraft, N8079U, was being prepared for the flight to Dayton. At 1926:09 the crew called for items on the before start checklist. At 1927:25 the First Officer gave a takeoff and emergency brief, and the Captain concurred. After completing the before taxi checklist, the First Officer made a radio transmission to the Mather Field unicom frequency at 1940:39 indicating that Emery flight 17 was about to taxi to runway 22 left. A guard helicopter (identified as 16719) reported crossing the numbers for the north helipad at 1946:43, and at 1946:58 Emery flight 17 requested their release to Dayton from the Sacramento approach controller.

At 1948:10 the Second Officer reported that the before takeoff checklist was complete. There was a sound similar to increasing engine RPM and the Captain called “rotate” at 1949:06. Five alerts similar to the stabilizer trim in motion alert were immediately recorded. At 1946:19 the First Officer stated that they were “going back.” After a sound similar to the stick shaker was recorded, the Captain declared an emergency to Sacramento approach control at 1949:36. The GPWS system voice “pull up” was recorded at 1949:47 and at 1950:04 the Captain reported an “extreme CG problem” to Sacramento approach. At 1950:37 the First Officer explained that he was putting the aircraft into a bank in order to “make the airplane’s position match the elevator.” The recording ended at 1951:09 following the initial sound similar to impact.

Anna W. Cushman
Aerospace Engineer (CVR)

Transcript of a Sundstrand AV557 tape cockpit voice recorder (CVR), installed on a DC8-71F (N8079U, Emery flight 17), which crashed after takeoff from Mather Field in Rancho Cordova, California on February 16, 2000.

LEGEND

CAM	Cockpit area microphone voice or sound source
RDO	Radio communications transmitted to and from N8079U
APR	Radio transmission from Sacramento approach controller
GND	Radio transmission from Mather Field ramp personnel
-1	Voice identified as the Captain
-2	Voice identified as the First Officer
-3	Voice identified as the Second Officer
-4	Unidentified female voice
-?	Voice unidentified
*****	Unintelligible word
#	Expletive
@	Non-pertinent word
( )	Questionable insertion
[ ]	Editorial insertion
...	Pause

Note 1: Times are expressed in pacific standard time (PST).

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.

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.

Time (PST) SOURCE	CONTENT
19:17:45	
Start of Recording	
Start of Transcript	
19:17:47	
CAM-1	*** shower shower and shave. got something to eat twice.
19:17:52	
CAM-2	(talk about standards) / (* stand by say again) [three members]
19:17:53	
CAM-2	[sound of laughter] sounds like you made the most of your hub time.
19:17:57	
CAM-1	you know quality hub time.
19:18:08	
CAM-?	*.

Time (PST) SOURCE	CONTENT
19:17:45	
RDO	[recorded on channel four, repeats until 1933:02] Sacramento Mather Airport automated weather information zero three one eight zero Zulu. weather wind calm. visibility more than one zero. sky condition ceiling niner thousand overcast. temperature eight Celsius. dew point seven Celsius. altimeter three zero zero zero. remarks. taxiway Delta is limited to aircraft that weigh less than seventeen thousand pounds.

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:18:21 **CAM-2**	** @@ *.		
19:18:22 [CVR reverses tape direction]			
19:18:24 [audio interruption on all four channels due to CVR tape heat damage]			
19:18:24 **CAM-?**	I ('m/not) quite sure (yet).		
19:18:26 **CAM-?**	well I'm almost positive **.		
19:18:38 **CAM-?**	***.		
19:18:39 **CAM-?**	***.		
19:19:01 **CAM-?**	[sound of sigh]		
19:19:02 **CAM**	[sound of clearing throat]		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:19:20 **CAM**	[sound of clicking]		
19:19:31 **CAM**	[sound similar to paper rustling]		
19:19:34 **CAM-2**	you got all the releases?		
19:19:36 **CAM-?**	***.		
19:19:41 **CAM**	[sound similar to paper rustling]		
19:19:44 **CAM-?**	these are ours.		
19:19:45 **CAM-2**	yeah.		
19:19:46 **CAM**	[sound of clacks]		
19:19:50 **CAM-?**	[sound of clearing throat]		

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:19:52	**CAM-?**	**.			
19:20:03	**CAM-1**	and then missed approach in Reno. couldn't get in the one way on one six...			
19:20:06	**CAM-2**	oh.			
19:20:07	**CAM-1**	...and we went around ***...			
19:20:09	**CAM-2**	ah huh.			
19:20:11	**CAM-1**	...three four.			
19:20:14	**CAM-2**	I tell you that ah ILS man... [sound of chuckle]... (nasty).			
19:20:21	**CAM-2**	it's gotta be better than VFR to shoot the ILS.			
19:20:27	**CAM-1**	well even on that even on that localizer to three four left...			

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:20:30 **CAM-2**	ah huh.		
19:20:31 **CAM-1**	...reached down to I think he said fifty sixty.		
19:20:32 **CAM**	[sound of clunk]		
19:20:34 **CAM-2**	mmm hmm.		
19:20:35 **CAM-1**	that mountain is right there to the right...		
19:20:36 **CAM**	[sound of clicks]		
19:20:38 **CAM-2**	yeah.		
19:20:38 **CAM-1**	... you know on that approach there I mean it its above you. ***.		
19:20:43 **CAM-1**	** if you got off on that one ***.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:20:46 **CAM-2**	* know.		
19:20:47 **CAM-1**	cumulo granite *.		
19:20:49 **CAM-2**	yep.		
19:20:53 **CAM-?**	*.		
19:21:05 **CAM-1**	yeah after the first delay I called scheduling and I said look I'm commuting to Reno on this airplane you know. just to let you know that 's what I'm doing. okay @ all right. so like six hours (pass). you know I'm commuting on this airplane. ahh yeah we do. okayy. after nine hours @ calls. says ah @ ah commuting on this airplane to Reno? I said yeah. I said I told two other predecessors of yours. he says well I'm just double checking. I said well what you really want to know @ is if I'm gonna call in fatigued when I get there. yeah that's exactly what I want to know.		
19:21:50 **CAM-2**	In fact don't you just ah...		
19:21:52 **CAM-1**	I said @ I fully intend on you know operating the trip. as of right now I'm feeling fine. okaay that's all I wanted to know. ** okay fine.		

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:22:25	**CAM-2**	that's exactly what I want to know.			
19:23:14	**CAM-1**	it's your leg. your (brief) [unintelligible, three members].			
19:23:16	**CAM-2**	I figured as much.			
19:23:28	**CAM-2**	yeah if you want to doze feel free. I don't care.			
19:23:32	**CAM-1**	I'll be dozing then.			
19:23:33	**CAM-?**	[sound of laughter]			
19:23:33	**CAM-2**	*** check yeah he'll be drooling over there and #.			
19:23:44	**CAM-2**	looking like you're in the dentist's office.			
19:23:55	**CAM**	[sound similar to hot pot movement]			

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:24:10	**CAM**	[sound similar to ULD being loaded, ending with a clunk]			
19:24:15	**CAM-?**	*** let's move this over there where it's supposed to be.			
19:24:16	**CAM**	[sound similar to movement of metal paper holder]			
19:24:18	**CAM-?**	cool.			
19:24:26	**CAM-?**	clear on the aux pump.			
19:24:28	**CAM-3**	yep.			
19:24:31	**CAM-2**	so how's the weather over in Reno?			
19:24:33	**CAM-3**	ehh kind of raining all day **.			
19:24:37	**CAM-2**	no no white stuff?			

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:24:39 **CAM-3**	we haven't had any decent snow at all this year I don't know what the deal is.		
19:24:44 **CAM-?**	me neither.		
19:24:44 **CAM-?**	[sound of clearing throat]		
19:24:48 **CAM-?**	what was that stab?		
19:24:49 **CAM-2**	ah one point nine?		
19:24:54 **CAM-?**	one point six.		
19:24:55 **CAM**	[sound similar to stabilizer trim in motion alert, four alerts for approximately five seconds]		
19:25:00 **CAM-2**	* coffee?		
19:25:01 **CAM-3**	yeah I just fired up the water.		

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:25:03	**CAM-2**	coool.			
19:25:05	**CAM-?**	***.			
19:25:07	**CAM-2**	I think I. I think I better drink some.			
19:25:09	**CAM**	[sound of two clicks]			
19:25:09	**CAM-?**	[sound of sigh]			
19:25:10	**CAM-2**	just to be safe.			
19:25:11	**CAM-?**	yeah.			
19:25:22	**CAM-?**	(let's see *). [unintelligible, three members]			
19:25:42	**CAM-?**	[sound of sigh]			

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:25:47	**CAM-1**	are you through over there.			
19:25:48	**CAM-?**	(I) see some ***. [possibly CAM-1]			
19:25:49	**CAM-2**	sure.			
19:25:51	**CAM-?**	something's not right.			
19:25:53	**CAM-?**	I I swear.			
19:25:56	**CAM-?**	(must be mistaken).			
19:25:58	**CAM-?**	***.			
19:26:01	**CAM-?**	*** swap positions here.			
19:26:05	**CAM-?**	oh yeah.			

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:26:06 **CAM-?**	[sound of chuckle]		
19:26:08 **CAM-?**	ready ** before start.		
19:26:09 **CAM-2**	I'm ready.		
19:26:10 **CAM-2**	rudder and aileron trim.		
19:26:12 **CAM-1**	free and zero.		
19:26:13 **CAM-2**	LRN radio transfer switches.		
19:26:15 **CAM-1**	raaa-dio left.		
19:26:16 **CAM-2**	radio right.		
19:26:18 **CAM-2**	radios LRNs		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:26:19 **CAM**	[sound of click]		
19:26:21 **CAM-1**	set for departure. your (time).		
19:26:23 **CAM-2**	set for departure.		
19:26:26 **CAM-2**	* one zero.		
19:26:28 **CAM-2**	Sacramento fifteen point two. three thousand. squawk's in the box. set for departure information.		
19:26:35 **CAM-2**	clocks and altimeters.		
19:26:38 **CAM-1**	three thousand.		
19:26:41 **CAM-2**	three thousand.		
19:26:42 **CAM-3**	three thousand.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:26:43 **CAM-2**	ignition inverter.		
19:26:44 **CAM-3**	armed.		
19:26:44 **CAM**	[sound of clicks]		
19:26:45 **CAM-2**	cabin pressure controller.		
19:26:46 **CAM-3**	set.		
19:26:46 **CAM-2**	packs recirc fan.		
19:26:47 **CAM-3**	off.		
19:26:48 **CAM-2**	pneumatic switches.		
19:26:49 **CAM-3**	auto.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:26:50 **CAM-2**	under floor heat.		
19:26:51 **CAM-3**	off.		
19:26:51 **CAM-2**	oil and hydraulic quantity.		
19:26:53 **CAM-3**	normal.		
19:26:54 **CAM-2**	fuel.		
19:26:56 **CAM-3**	sixty seven point seven.		
19:26:59 **CAM-1**	sixty six.		
19:27:01 **CAM-2**	aand parking brake.		
19:27:03 **CAM-1**	set.		

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:27:04	**CAM-3**	[sound of clearing throat] pressures... checked.			
19:27:06	**CAM-2**	before start down the line is complete.			
19:27:08	**CAM-1**	your leg. your brief.			
19:27:10	**CAM**	[sound similar to overspeed warning]			
19:27:16	**CAM-?**	[sound of whistling]			
19:27:20	**CAM**	whoop whoop pull up glide slope. [GPWS voice]			
19:27:25	**CAM-2**	ah it'll be a right seat. reduce power noise abatement profile on two two left. [sound of clearing throat]. turn left to a heading zero nine zero. we're cleared up to three thousand. squawk is in the box. ah standard Emery procedures if there's a problem. we'll come back here and land on ah two two.			
19:27:48	**CAM-1**	sounds good.			

Time (PST)	SOURCE	CONTENT
19:27:50	**CAM**	[sound similar to paper rustling]
19:27:58	**CAM-?**	she's real pretty.
19:27:59	**CAM-3**	(no doubt).
19:28:06	**CAM**	[sound of squeak, similar to crewmember seat]
19:28:11	**CAM-1**	can you take the gust lock off for a second.
19:28:12	**CAM-2**	yah.
19:28:16	**CAM**	[sound similar to gust lock handle movement]
19:28:47	**CAM**	[sound of clunk]

Time (PST)	SOURCE	CONTENT
19:29:13	**RDO**	[UPS eight nine five released two two left Mather]

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:29:14	**CAM-4**	what could be a regular forty five minute turn?			
19:29:18	**CAM-1**	well we're late. we're late inbound. 'cause late equipment.			
19:29:22	**CAM-4**	no I I realize that. I mean...			
19:29:24	**CAM-2**	because of the (aircraft's/excess) break.			
19:29:24	**CAM-4**	...you're allowed to be on the ground.			
19:29:25	**CAM-?**	*.			
19:29:25	**CAM-4**	yeah. forty five minutes normally. yeah. because of the extra break. still forty five minutes?			
19:29:31	**CAM-2**	I think. I don't think they adjust for.			
19:29:35	**CAM-1**	yeah it's just a regular off (load) [sound of clearing throat] off load on load deal. [sound of clearing throat]			

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:29:35 **CAM**	[sound similar to motor from loading equipment]		
19:29:42 **CAM-4**	um * position two *.		
19:29:44 **CAM-4**	** putting up position two right now.		
19:29:49 **CAM-?**	then we're good *.		
19:29:51 **CAM-?**	when was block? [male voice]		
19:29:52 **CAM-?**	thirty two.		
19:29:55 **CAM-2**	looks like an hour and ah.		
19:29:57 **CAM-4**	maybe an hour and.		
19:29:58 **CAM-2**	* five minutes.		

Time (PST) SOURCE	CONTENT
19:30:00 **CAM-1**	I can give you a few minutes but I can't give you fifteen.
19:30:03 **CAM-4**	that's all right. aaw whatever. all right I just wanted to check that. if not fine. I've got extra freight to Louisville.
19:30:09 **CAM**	[sound similar to paper rustling]
19:30:11 **CAM-?**	*.
19:30:15 **CAM-4**	are you guys coming back through tonight? ...anybody.
19:30:20 **CAM-2**	we're coming through friday.
19:30:21 **CAM-3**	friday morning.
19:30:23 **CAM-4**	*** donuts?

Time (PST) SOURCE	CONTENT
19:30:12 **RDO**	[UPS nine fifty five requesting clearance from Sacramento departure]

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:30:25 **CAM-2**	I could do some donuts.		
19:30:28 **CAM-?**	that'll be great. [male voice]		
19:30:29 **CAM-2**	you know we really appreciate what you got going on **it's very nice.		
19:30:29 **CAM**	[sound of squeak]		
19:30:33 **CAM-4**	oh that's all right.		
19:30:35 **CAM-4**	I'd I'd * like if somebody did it for me.		
19:30:38 **CAM**	[sound of laughter]		
19:30:40 **CAM-4**	okay.		
19:30:41 **CAM-?**	we appreciate it.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:30:42 **CAM-4**	you're welcome.		
19:30:45 **CAM-4**	you want dozen donuts. or do you want your own little thing?		
19:30:48 **CAM-2**	yeah I think we'll just do the dozen.		
19:30:49 **CAM-3**	yeah that sounds good.		
19:30:50 **CAM-4**	okay but what's your favorite?		
19:30:52 **CAM-1**	couple of jelly. couple of ah glazed.		
19:30:57 **CAM**	[background noise similar to loading equipment]		
19:30:57 **CAM-3**	you know what I like.		
19:31:06 **CAM-4**	you want any coffees?		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:31:06 **CAM**	[sound similar to muffled voices]		
19:31:08 **CAM-?**	ahhh. [male voice]		
19:31:09 **CAM-4**	**.		
19:31:11 **CAM-?**	decaf. [male voice]		
19:31:12 **CAM-4**	one decaf.		
19:31:14 **CAM**	[sound of clacks]		
19:31:14 **CAM-2**	yeah I've got my own in my bag.		
19:31:28 **CAM-4**	okay. one decaf. a dozen donuts. want anything for friday * to drink? **.		
19:31:35 **CAM-3**	ehh ** just a pile of black coffee.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:31:38 **CAM-4**	you want a special one or regular?		
19:31:38 **CAM-?**	*.		
19:31:41 **CAM-3**	just a regular one.		
19:31:42 **CAM-?**	you already got the * we got the donuts this time right? [male voice]		
19:31:44 **CAM-?**	yep. [male voice]		
19:31:44 **CAM-?**	yeah. [male voice]		
19:31:45 **CAM-1**	* start check *.		
19:31:46 **CAM-2**	all right.		
19:31:47 **CAM-4**	'kay see you guys.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:31:47 **CAM-?**	thanks. [male voice]		
19:31:48 **CAM-?**	all right. [male voice]		
19:31:48 **CAM-4**	uh huh bye.		
19:31:52 **CAM-1**	still working on the bellies?		
19:31:55 **CAM-?**	***.		
19:31:57 **CAM-?**	almost went for a ride. [male voice, lower in volume]		
19:32:04 **CAM**	[sound similar to paper rustling]		
19:32:06 **CAM-?**	***.		
19:32:07 **CAM-?**	saw that *** are they still working on that *.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:32:10 **CAM**	[sound similar to paper rustling]		
19:32:10 **CAM-?**	I think so. ***.		
19:32:22 **CAM-?**	*.		
19:32:23 **CAM**	[sound similar to seat belt movement and clasp]		
19:32:30 **CAM**	[sound similar to cockpit door closing]		
19:32:31 **CAM**	[sound of creaking, similar to crew member seat]		
19:32:32 **CAM-3**	*** buttoned up.		
19:32:33 **CAM-2**	shall I?		
19:32:35 **CAM-?**	*.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:32:36 **CAM-2**	logs and ship's papers.		
19:32:38 **CAM-3**	on board.		
19:32:38 **CAM-2**	take off data and briefing.		
19:32:40 **CAM-1**	set and reviewed.		
19:32:41 **CAM-2**	set and reviewed.		
19:32:41 **CAM-3**	set and reviewed.		
19:32:42 **CAM-2**	stabilizer.		
19:32:43 **CAM-1**	one point six.		
19:32:44 **CAM**	[sound of snap]		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:32:45 **CAM-2**	set one point six.		
19:32:46 **CAM-3**	one point six.		
19:32:46 **CAM-2**	INS mode selectors not installed. pitot AOA heat.		
19:32:49 **CAM-1**	on lights out.		
19:32:50 **CAM-2**	door warning lights.		
19:32:51 **CAM-3**	checked and out.		
19:32:52 **CAM-2**	main cargo door.		
19:32:53 **CAM-3**	closed latched and locked.		
19:32:53 **CAM-2**	anti-collision lights.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:32:54 **CAM-1**	on.		
19:32:55 **CAM-2**	manifold pressure.		
19:32:56 **CAM-1**	talk to him @.		
19:32:58 **CAM**	[sound of snap, similar to interphone handset removal]		
		19:33:02 **RDO**	[repeated ATIS on channel four ceases]
		19:33:03 **RDO-3**	you down there?
		19:33:10 **GND**	test.
19:33:17 **CAM**	[sound similar to pneumatic start cart motor rpm increasing]		
19:33:20 **CAM-?**	*.		

Time (PST) SOURCE	CONTENT
19:33:31 **CAM-2**	he might be on the interphone.
19:33:35 **CAM-2**	clear on three.
19:33:35 **CAM-1**	okay. turn three.
19:33:37 **CAM-2**	turning three.
19:33:39 **CAM-?**	*.

Time (PST) SOURCE	CONTENT
19:33:24 **GND**	ground's on.
19:33:29 **RDO-3**	we ah clear on three?
19:33:32 **RDO-3**	clear on three?
19:33:33 **GND**	you're clear on three.

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:33:43	**CAM-3**	twenty seven.			
19:33:44	**CAM-2**	N two.			
19:33:56	**CAM-2**	well we can even do a delayed engine start.			
19:34:01	**CAM-2**	N one.			
19:34:04	**CAM-3**	oil pressure.			
19:34:14	**CAM-?**	[sound of clearing throat]			
19:34:27	**CAM-2**	on...			
19:34:27	**CAM**	[sound of click]			
19:34:29	**CAM-2**	... fuel flow. EGT.			

Time (PST) SOURCE	CONTENT
19:34:37 **CAM**	[sound of clicking]
19:34:40 **CAM**	[sound of click]
19:34:55 **CAM-2**	fifty released.
19:34:56 **CAM**	[sound of click]
19:34:57 **CAM-3**	valve closed.
19:35:00 **CAM-1**	turn four.
19:35:02 **CAM-2**	cut back.

Time (PST) SOURCE	CONTENT
19:35:02 **RDO-3**	clear four?
19:35:04 **GND**	clear four.

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:35:05 **CAM-2**	turning four.		
19:35:06 **CAM-3**	valve open.		
19:35:08 **CAM-3**	twenty seven.		
19:35:09 **CAM-2**	N two.		
19:35:13 [CVR reverses tape direction]			
19:35:19 **CAM-2**	N one.		
19:35:20 **CAM-3**	oil pressure.		
19:35:41 **CAM-1**	go ahead.		
19:35:42 **CAM-2**	fuel. EGT.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:35:47 **CAM-2**	fuel flow.		
19:36:12 **CAM-2**	fifty released.		
19:36:13 **CAM**	[sound of click]		
19:36:14 **CAM-3**	valve closed.		
		19:36:16 **RDO-3**	clear two?
		19:36:17 **GND**	clear two.
19:36:22 **CAM-2**	cut back. starting number two.		
19:36:26 **CAM-3**	valve open.		
19:36:27 **CAM-3**	twenty seven.		

Time (PST)	SOURCE	CONTENT
19:36:28	**CAM-2**	N two.
19:36:50	**CAM-2**	N one.
19:37:17	**CAM-2**	time.
19:37:18	**CAM-2**	fuel. flow. EGT.
19:37:21	**CAM**	[sound of clicks]
19:37:47	**CAM-2**	fifty released.
19:37:47	**CAM**	[sound of click]
19:37:48	**CAM-3**	valve closed.

Time (PST)	SOURCE	CONTENT
19:37:51	**RDO-3**	clear one?

Time (PST)	SOURCE	CONTENT
19:37:54	**CAM-2**	cut back. turning one.
19:37:55	**CAM**	[sound of clicking]
19:37:58	**CAM-3**	valve open.
19:37:58	**CAM-2**	N two.
19:37:59	**CAM-3**	twenty seven.
19:38:04	**CAM**	[sound of click]
19:38:12	**CAM**	[sound similar to seat belt clasp]
19:38:19	**CAM-2**	N one.

Time (PST)	SOURCE	CONTENT
19:37:53	**GND**	clear on one.

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:38:23 **CAM-3**	oil pressure.		
19:38:45 **CAM-1**	turn it on.		
19:38:45 **CAM**	[sound of click]		
19:38:46 **CAM-2**	fuel. flow. EGT.		
19:39:12 **CAM-2**	fifty released.		
19:39:12 **CAM**	[sound of click]		
19:39:13 **CAM-3**	valve closed.		
19:39:17 **CAM-2**	cut back.		
19:39:18 **CAM-1**	internal.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
		19:39:19 **RDO-3**	we have four good ones you can go ahead and pull the air and power.
		19:39:21 **GND**	all right. can I get a block time.
19:39:23 **CAM-3**	block time?		
19:39:25 **CAM-1**	ehh thirty five.		
		19:39:26 **RDO-3**	thirty five.
		19:39:27 **GND**	thank you have a good flight.
		19:39:29 **RDO-3**	thanks so long.
19:39:30 [sound similar to four electrical clicks on all channels]			
19:39:50 **CAM**	[sound of increasing frequency noise, similar to air conditioning pack spooling up]		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:39:53 **CAM-1**	gust lock off. power the controls. clear left.		
19:39:56 **CAM-2**	clear right. ohp sorry.		
19:39:58 **CAM**	[sound of squeak]		
19:40:00 **CAM-1**	after start.		
19:40:01 **CAM**	[sound similar to seat belt movement]		
19:40:04 **CAM**	[sound similar to burst of air from rain removal system]		
19:40:04 **CAM-?**	[sound of clearing throat]		
19:40:06 **CAM-2**	engine anti-ice.		
19:40:07 **CAM-1**	off.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:40:08 **CAM**	[sound similar to latched/detent handle movement]		
19:40:08 **CAM-2**	rain removal.		
19:40:09 **CAM-1**	checked off.		
19:40:10 **CAM-2**	checked off. gust lock off. electrical system.		
19:40:12 **CAM-3**	checked.		
19:40:13 **CAM-2**	hydraulic system.		
19:40:14 **CAM-3**	checked.		
19:40:15 **CAM-2**	rudder and aileron power.		
19:40:17 **CAM-3**	on. reversion lights out.		

Time (PST) SOURCE	CONTENT
19:40:18 **CAM-2**	grround equipment.
19:40:22 **CAM-1**	clear left.
19:40:23 **CAM-2**	aannd clear right. before taxi complete.
19:40:48 **CAM-2**	and clear right.
19:40:54 **CAM**	[sound similar to engine rpm increasing, then varying for approximately twenty seconds]
19:41:06 **CAM**	[sound of rhythmic clicking intermittent for approximately ten seconds]
19:41:19 **CAM**	[sound of three clicks]
19:41:28 **CAM-1**	flaps fifteen. control check.

Time (PST) SOURCE	CONTENT
19:40:39 **RDO-2**	Mather traffic Emery seventeen heavy taxi from the ah southwest cargo area runway two two left Mather.

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:41:32 **CAM**	[sound similar to latched/detent handle movement]		
19:41:41 **CAM-2**	aaailerons llleft. center.		
19:41:45 **CAM-3**	checked.		
19:41:47 **CAM-2**	right. center.		
19:41:49 **CAM-3**	checked.		
19:41:49 **CAM**	[sound of click]		
19:41:54 **CAM-1**	sure go ahead UPS.		
19:41:58 **CAM**	[sound of clicks]		
19:42:13 **CAM-2**	tightest ship in the shipping business.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:42:17 **CAM-1**	ready on the rudders?		
19:42:18 **CAM-3**	yep.		
19:42:20 **CAM-2**	you're ah... clear right.		
19:42:21 **CAM-1**	left rudder. center.		
19:42:23 **CAM-3**	checked.		
19:42:24 **CAM-1**	right rudder. center.		
19:42:25 **CAM-3**	checked.		
19:42:27 **CAM-1**	elevator forward. coming back.		
19:42:29 **CAM-2**	EPI checks.		

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:42:30	**CAM-1**	taxi check.			
19:42:31	**CAM-3**	taxi check list. flaps and slots.			
19:42:36	**CAM-1**	ahh fifteen. fifteen. fifteen. slot light's out.			
19:42:39	**CAM-2**	fifteen. fifteen. fifteen. slot light's out.			
19:42:43	**CAM-3**	controls EPI.			
19:42:44	**CAM-2**	checked.			
19:42:45	**CAM-3**	checked.			
19:42:46	**CAM-3**	fuel panel set. spoilers.			
19:42:49	**CAM-2**	retracted. lights out.			

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:42:51 **CAM-3**	fuel levers.		
19:42:52 **CAM-2**	on in detent.		
19:42:53 **CAM-3**	yaw damper.		
19:42:54 **CAM-2**	on.		
19:42:55 **CAM-3**	stabilizer.		
19:42:58 **CAM-1**	one point six.		
19:43:00 **CAM-2**	set one point six.		
19:43:01 **CAM-3**	one six.		
19:43:03 **CAM-3**	shoulder harness.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:43:06 **CAM-1**	on the left.		
19:43:06 **CAM-2**	on the right.		
19:43:08 **CAM-3**	(rear).		
19:43:09 **CAM-3**	take off data briefing.		
19:43:12 **CAM-?**	[sound of throat clearing]		
19:43:13 **CAM-1**	set left reviewed.		
19:43:15 **CAM-2**	set and reviewed.		
19:43:16 **CAM-?**	set ***.		
19:43:19 **CAM-3**	flight nav instruments.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:43:20 **CAM**	[sound of click]		
19:43:21 **CAM-1**	set left.		
19:43:22 **CAM-2**	set right.		
19:43:23 **CAM-3**	taxi checklist complete.		
		19:43:26 **RDO**	[transmission from guard helicopter one six seven one nine – position report to Mather]
19:43:30 **CAM-?**	**.		
19:43:30 **CAM**	[sound of laughter]		
19:43:32 **CAM-2**	sounds like he's getting a massage.		
19:43:39 **CAM-3**	whirling dervish.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:43:43 **CAM-2**	that'd be fun. I've never been I've been in one of those airstar helicopters you know like the Cadillac of helicopters. I've never really been in a a helicopter you know.		
19:43:53 **CAM-3**	I went up one those R twenty two Robinsons.		
19:43:56 **CAM-2**	yeah...		
19:43:56 **CAM-3**	that was a * thing.		
19:43:57 **CAM-2**	...now that was a helicopter.		
19:43:58 **CAM-2**	yeah.		
19:43:59 **CAM-3**	went up to * and did some autorotations. that was a blast.		
19:44:04 **CAM-3**	really weird going that slow in the air though. I don't like it. [sound of chuckle]		
19:44:09 **CAM-2**	hey you're you're hanging by that bolt you know.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:44:12 **CAM-3**	yeah... Jesus nut.		
		19:44:14 **APR**	[Sacramento approach release for UPS nine fifty five]
19:44:15 **CAM-2**	yep.		
		19:44:28 **RDO**	[UPS nine fifty five transmission departing Mather]
19:44:40 **CAM-1**	he must be in a hurry.		
19:44:42 **CAM-2**	he must be yeah.		
19:44:48 **CAM**	[sound similar to engine rpm increasing]		
19:44:49 **CAM-2**	he probably gets ICP.		
19:45:13 **CAM**	[sound of snap]		

Time (PST) SOURCE	CONTENT
19:46:12 **RDO**	[UPS nine fifty five in left hand turn to zero nine zero heading]
19:46:43 **RDO**	[guard helicopter seven one nine crossing the numbers for two two left for taxi to north helipad]
19:46:52 **CAM-2**	oh there he is.
19:46:53 **CAM-1**	yeah. *.
19:46:58 **RDO-2**	Sacramento departure Emery seventeen heavy number one two two left Mather. need our release to ah... Dayton.
19:47:07 **CAM-2**	* position lights?
19:47:07 **CAM-1**	clear right.
19:47:08 **CAM-2**	yeah just that one beacon.
19:47:11 **CAM-3**	no I I see 'em.

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:47:12 **CAM-?**	***.		
19:47:13 **CAM-2**	that's * light. yeah that's an instrument light.		
		19:47:14 **APR**	Emery seventeen heavy Sacramento approach you're released for departure report airborne.
19:47:16 **CAM**	[sound of four clicks]		
19:47:18 **CAM**	[sound of clicking]		
		19:47:20 **RDO-2**	Emery seventeen heavy we'll call you in the air.
19:47:21 **CAM-?**	** position lights.		
19:47:24 **CAM-1**	before takeoff.		
19:47:25 **CAM**	[sound similar to brake release]		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:47:28 **CAM-1**	before takeoff checklist.		
19:47:29 **CAM**	[sound similar to increasing engine rpm]		
		19:47:30 **RDO-2**	Mather area traffic Emery seventeen heavy runway two two left be a left downwind departure Mather.
19:47:30 **CAM**	[sound of a clunk]		
19:47:34 **CAM**	[sound of two clunks]		
19:47:40 **CAM-?**	[sound of clearing throat]		
19:47:40 **CAM-2**	okay you're clear on the right.		
19:47:52 **CAM-3**	anti-skid.		
19:47:55 **CAM-2**	armed. light's out.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:47:56 **CAM-3**	ignition.		
19:47:57 **CAM-2**	all engines both.		
19:47:58 **CAM-3**	transponder. DME.		
19:47:59 **CAM-2**	on.		
19:48:00 **CAM-2**	reverse switch.		
19:48:01 **CAM-2**	open pressure checks.		
19:48:02 **CAM-3**	spoiler pumps normal. stand by rudder pump start. packs are off. boost pumps boost and feed. landing lights.		
19:48:07 **CAM-1**	on.		
19:48:08 **CAM-3**	parking brake.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:48:09 **CAM**	[sound of three clicks]		
19:48:10 **CAM-1**	released.		
19:48:10 **CAM-3**	before takeoff checklist complete.		
19:48:11 **CAM-1**	your brakes.		
19:48:12 **CAM-2**	yeah.		
19:48:15 **CAM**	[sound similar to increasing engine rpm]		
19:48:16 **CAM**	[sound of click]		
19:48:21 **CAM**	[sound of creak]		
19:48:23 **CAM-2**	stand by four. there we go.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:48:24 **CAM-3**	four spooled.		
19:48:40 **CAM-1**	set reduced.		
19:48:44 **CAM-1**	airspeed's alive.		
19:48:44 **CAM-2**	alive here.		
19:48:45 **CAM**	[sound of two clicks, first louder than second]		
19:48:50 **CAM-1**	eighty knots.		
19:48:51 **CAM-2**	eeighty knots...		
19:48:52 **CAM**	[sound of two clunks, first softer than second]		
19:48:53 **CAM-2**	...elevator checks.		

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:48:54	**CAM**	[sound of two clunks, first louder than second]			
19:48:55	**CAM**	[sound of ratcheting noise, ending with clunk]			
19:48:57	**CAM**	[sound of clunk]			
19:49:02	**CAM-1**	V one.			
19:49:06	**CAM-1**	rotate.			
19:49:08	**CAM**	[sound similar to stabilizer trim in motion alert]			
19:49:08	**CAM-1**	** (go)...			
19:49:09	**CAM**	[sound similar to stabilizer trim in motion alert]			
19:49:09	**CAM-1**	...watch the tail.			

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:49:11 **CAM**	[sound similar to stabilizer trim in motion alert]		
19:49:12 **CAM**	[sound similar to stabilizer trim in motion alert]		
19:49:13 **CAM-1**	V two.		
19:49:14 **CAM**	[sound similar to stabilizer trim in motion alert]		
19:49:14 **CAM-1**	positive rate.		
19:49:16 **CAM-2**	I got it.		
19:49:17 **CAM-1**	you got it?		
19:49:17 **CAM-2**	yep.		
19:49:18 **CAM-1**	all right.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:49:18 **CAM**	[sound of two clicks]		
19:49:19 **CAM-2**	we're going back.		
19:49:20 **CAM-3**	what the #?		
19:49:20 **CAM-2**	CG's waay out of limits.		
19:49:25 **CAM-3**	#. do you want to pull the power back?		
19:49:27 **CAM**	[sound similar to decreasing engine rpm]		
19:49:29 **CAM**	[sound similar to stick shaker]		
19:49:30 **CAM-2**	oh #.		
19:49:30 **CAM-1**	push forward.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:49:31 **CAM-2**	goddd... #.		
19:49:34 **CAM-2**	god.		
		19:49:36 **RDO-1**	Emery seventeen emergency.
19:49:38 **CAM-2**	ahhh #.		
		19:49:40 **APR**	Emery seventeen Sacramento departure radar contact say again?
19:49:40 **CAM-2**	you steer. I'm pushing.		
		19:49:44 **RDO-1**	Emery seventeen has an emergency.
19:49:44 **CAM-3**	we're sinking. we're going down guys.		
		19:49:46 **APR**	Emery seventeen go ahead.

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:49:46	**CAM**	[sound similar to increased engine rpm]			
19:49:47	**CAM**	whoop whoop pull up whoop whoop pull up whoop whoop pull up whoop whoop pull up whoop...			
19:49:47	**CAM-2**	power.			
19:49:51	**CAM-2**	#.			
19:49:51	**CAM**	... whoop pull up. [GPWS voice]			
19:49:52	**CAM-1**	all right all right... all right.			
19:49:54	**CAM-2**	push.			
19:49:54	**CAM-3**	okay so... we're going back up.			
19:49:55	**CAM**	[sound of two clunks]			

Time (PST) SOURCE	CONTENT
19:49:57 **CAM-3**	there you go.
19:49:58 **CAM-1**	roll out.
19:49:59 **CAM-?**	roll out.
19:50:01 **CAM-?**	[sound of strained exhale]
19:50:07 **CAM-3**	#.
19:50:10 **CAM-?**	[sound of strained exhale]
19:50:11 **CAM-3**	anything I can do guys.

Time (PST) SOURCE	CONTENT
19:50:04 **RDO-1**	Emery seventeen extreme CG problem.
19:50:06 **APR**	Emery seventeen roger.

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:50:11 **CAM-1**	roll out to the right.		
19:50:12 **CAM-2**	okay.		
19:50:15 **CAM-2**	push.		
19:50:16 **CAM-?**	push forward.		
19:50:18 **CAM-2**	awww...		
19:50:19 **CAM**	[sound of creaking]		
19:50:19 **CAM-2**	...#.		
19:50:22 **CAM-?**	#.		
19:50:25 **CAM-2**	okay.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:50:26 **CAM-3**	you got the trim maxed?		
19:50:28 **CAM-2**	power.		
19:50:28 **CAM-3**	more?		
19:50:29 **CAM-2**	yeah.		
19:50:29 **CAM**	whoop whoop pull up whoop whoop pull up whoop...		
19:50:32 **CAM-2**	we're gonna have to land fast.		
19:50:32 **CAM**	...whoop pull up whoop whoop pull up. [GPWS voice]		
19:50:36 **CAM-1**	left turn.		
19:50:36 **CAM-2**	okay.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:50:37 **CAM-2**	what I'm trying to do is make the airplane's position match the elevator. that's why I'm putting it in a bank.		
19:50:45 **CAM-1**	all right.		
19:50:45 **CAM-2**	okay.		
19:50:46 **CAM-1**	left turn.		
19:50:46 **CAM-2**	so we're gonna have to land it in like a turn.		
19:50:47 **CAM-1**	bring it around.		
19:50:48 **CAM**	[sound similar to stick shaker]		
19:50:49 **CAM-1**	bring it around.		
19:50:49 **CAM-2**	god #.		

Time (PST) SOURCE	CONTENT	Time (PST) SOURCE	CONTENT
19:50:51 **CAM-?**	[sound of grunt]		
19:50:51 **CAM**	[sound of rustling]		
19:50:53 **CAM-3**	#.		
19:50:54 **CAM-2**	you got the airport?		
19:50:56 **CAM-1**	bring it around.		
19:50:56 **CAM**	[sound of snap]		
19:51:00 **CAM-2**	power.		
19:51:02 **CAM**	whoop whoop pull up whoop. [GPWS voice]		
19:51:02 [audio interruption on all four channels due to CVR tape heat damage]			

Time (PST)	SOURCE	CONTENT	Time (PST)	SOURCE	CONTENT
19:51:07	**CAM-2**	power.			
19:51:07	**CAM-2**	aww #.			
19:51:08	**CAM-?**	**.			
19:51:08	**CAM**	[sound similar to impact]			
19:51:09	**End of Transcript** **End of Recording**				