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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION
COCKPIT VOICE RECORDER

(53 Pages)

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

GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

Cockpit Voice Recorder

DCA00MA023

by

Douglass P. Brazy
Mechanical Engineer (CVR)

Warning
The reader of this report is cautioned that the transcription of a CVR tape is not a precise science but is the best product possible from an NTSB 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

December 13, 2000

Cockpit Voice Recorder

Group Chairman's Factual Report
by Douglass P. Brazy

A. ACCIDENT

Location:	Near Port Hueneme, CA
Date:	January 31, 2000
Time:	1621 Pacific Standard Time
Aircraft:	Boeing MD-83, N963AS
Operator:	Alaska Airlines, Flight 261

B. GROUP

Chairman:	Douglass P. Brazy Mechanical Engineer (CVR) National Transportation Safety Board
Member:	Don Bidlack Captain, 717 Fleet Manager The Boeing Company
Member:	Barry E. Rainey Pilot Air Line Pilots Association/Alaska Airlines
Member:	Tony James Air Safety Investigator Federal Aviation Administration
Member:	Ben Forrest Pilot Alaska Airlines

C. SUMMARY

On January 31, 2000, at about 1621 Pacific Standard Time (PST), Alaska Airlines flight 261, a Boeing MD-83, N963AS, crashed approximately 2.69 miles north of Anacapa Island, California into the Pacific Ocean. The flight, from Puerto Vallarta, Mexico to Seattle, Washington with an intermediate stop in San Francisco, was operating under title 14 CFR part 121. All 83 passengers and 5 crewmembers were fatally injured and the aircraft was destroyed. Visual meteorological conditions prevailed at the time of the accident.

The Cockpit Voice Recorder (CVR) contained approximately thirty-one minutes of Good[1] quality audio. The recording began at about 1549:49 PST during cruise flight, and ended at about 16:20:57 PST. A transcript of the entire recording can be found in Attachment II.

D. DETAILS OF INVESTIGATION

Recorder Examination

The NTSB Vehicle Recorders Division received a Fairchild[2] model A100A, serial number 62892 magnetic tape CVR. The recorder was received in a sealed plastic cooler, and was immersed in water. The water in the cooler had a slight odor of kerosene, but was relatively clear. The exterior of the CVR showed evidence of severe structural damage, however the internal tape exhibited no signs of physical damage. The bracket used for securing the Underwater Locator Beacon was not bolted to the protective steel "crash case" which houses the tape assembly. It was bolted to a separate metal plate located behind the exterior orange dust cover front panel. The bracket remained securely attached to this plate and the front cover, but the plate/front cover was mostly separated from the rest of the recorder and was easily removed. One

[1] See Attachment I for a CVR Quality Ranking Scale.
[2] Fairchild is now known as L^3 Communications.

portion of the bracket was severely bent, but was not fractured. The beacon was not in the bracket, nor was it in the cooler when the lab received it.

Recorder Disassembly, Tape Removal and Preparation

The recorder's dust cover was removed by cutting it away from the steel crash case using pneumatic tools. The crash case exhibited some evidence of impact damage, primarily denting and deformation on the exterior of the case. The case did not appear to have any punctures, fire, or other penetration damage. The case was disassembled using normal tools, however the head of one of the securing bolts had been sheared off. The internal tape spool dustcover was easily removed, and the tape and spool were found to be intact and in good condition. The only notable damage inside the crash case was a fracture in the spool cover assembly and some corrosion of the various metallic parts inside the crash case. The tape and spool were found to be wet, but otherwise intact.

The tape spool cover was removed with normal tools. The endless tape was then cut with a scissors, adjacent to the tape head assembly on the "oldest data" side of the head assembly. The tape and spool were removed from the recorder. A leader tape was spliced to each end. The tape and spool were then immersed in a bath of distilled water for cleaning. While underwater, the tape was spooled to a conventional reel for use with the CVR lab's tape playback equipment. After rinsing, the tape was removed from the water bath for further cleaning and drying. This process is done by manually spooling the tape back and forth between two reels while gently wiping the tape clean with a gauze cloth soaked in a cleaning solvent. During this process, a visual examination of the tape revealed no mechanical damage. Once cleaned and dried, the tape was played back normally and without difficulty using the CVR lab's playback equipment.

Readout

Prior to the readout, the proper tape playback speed was determined. The nominal record/playback speed of this model CVR is designed to be 1 and 7/8 inches per second. However, the actual tape speed during the recording will typically vary slightly from the design speed. When the tape is played back, minor adjustments to the nominal speed are normally required.

The tape was played back on a variable speed tape deck, and the speed of the deck was adjusted using a spectrum analyzer. The spectrum analyzer was configured to monitor and display any sound energy occurring at a frequency of 400 Hz. This frequency (and its harmonics) is generated by the AC electrical equipment in the airplane, and is typically recorded as “background noise” on one or more of the CVR’s four channels. This characteristic tone was easily heard on this particular recording. While playing a section of the tape and tracking 400 Hz on the spectrum analyzer, the playback speed was varied until a peak of energy is noted at 400 Hz. Using this method, the playback speed can be set to match the speed at which the tape was recorded with reasonable accuracy.

After the proper playback speed was determined, the audio on the tape was recorded to a digital computer based audio system, to preclude any undue wear on the original tape. This digital recording was then used for subsequent evaluation by NTSB staff and the CVR group.

CVR Channels

The recording consisted of four channels of Good quality audio information. One channel contained the cockpit area microphone (CAM) audio information. The CAM is mounted in the cockpit, in the overhead panel between the two pilots. It is designed to capture sounds and conversations in the cockpit area whenever the CVR system is powered.

Two of the channels contained audio information obtained from the Captain's and First Officer's audio panels, respectively. The audio panels are essentially an interface between the pilot's headsets (or the cockpit speaker) and the airplane's radio communication equipment. Radio transmissions (both transmitted and received), are captured on these channels. Additionally, "hot" microphone signals (when used) are captured through the audio panels on these channels. Hot microphones are the same microphones in the pilot's headsets that can be used for making radio transmissions. The "hot" means that they are always on and being recorded by the CVR, whether or not a radio transmission is being made. On this recording, it appears that a hot microphone was connected to the first officer's audio panel, as some intra-cockpit conversation was recorded on that particular channel. No intra-cockpit sounds or conversation could be heard on the captain's channel.

The fourth channel contained audio information from the aircraft's Public Address system.

Signal Processing

Audio from the airplane's VHF communications radios could be heard on the CAM channel throughout the recording. This indicates that the cockpit speaker system was on, and the CAM captured audio being output from the speaker system. At times, the radio communications from the overhead speaker would obscure other intra-cockpit conversation or sounds heard on the CAM channel. Since the audio being played by the speaker system is essentially identical to the audio from one or both of the pilots audio panels (which are both recorded on a separate channels on the CVR), a real time digital adaptive filter was used to reduce the level (volume) of sounds coming from the cockpit speaker system. This made the intra-cockpit conversations and sounds captured by the CAM easier to discern. Additionally, the level of the 400 Hz background tone (and its harmonics) was reduced using a digital comb filter. Both the adaptive and comb filters are applied to the output signal from the recording, and do not alter the recording itself. These filters are typically used in the NTSB lab when listening to CVR

recordings. Virtually all of the recorded conversations and sounds were easily discernable using only these two signal processing tools.

Group Activities

The CVR group convened February 4-6, 2000. The group reviewed the tape and prepared a transcript of the entire recording. The group repeatedly listened to the recording both with and without the signal processing noted above. Each channel was reviewed individually as well as in combination with the other channels. There was little difficulty identifying the sources of each comment, and the group agreed on the content of each comment and characterization of each sound in the attached transcript.

Timing and Correlation

The times reported in the attached CVR transcript are Pacific Standard Time (PST)[3]. The timing of the CVR content and the correlation with the Digital Flight Data Recorder information is covered in a separate report (Exhibit 12B), Cockpit Voice Recorder Timing and Correlation Study DCA00MA023.

Additional Information

Beginning approximately 3.8 seconds before the end of the recording, an additional sound was recorded in the background noise on the CAM channel and on the first officer's channel. The sound initially has a deceasing frequency, which drops from about 1290 Hz to about 900 Hz over the first quarter second. It then gradually increases over the next three and one half seconds to approximately 1170 Hz.

[3] Based on the clock used by Southern California Terminal Radar Approach Control (SOCAL TRACON) for recorded radar data.

Douglass P. Brazy

Mechanical Engineer (CVR)

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.

Attachment II – Transcript

Transcript of a Fairchild A100A cockpit voice recorder (CVR), s/n 62892, installed on Boeing MD-83, Registration N963AS. The airplane was operated by Alaska Airlines as Flight 261, when it crashed into the Pacific Ocean on January 31, 2000.

LEGEND

RDO Radio transmission from accident aircraft, Alaska 261

CAM Cockpit area microphone voice or sound source

PA Voice or sound heard on the public address system channel.

HOT Hot microphone voice or sound source[1]

For RDO, CAM, HOT, and PA comments:
- **-1** Voice identified as the Captain
- **-2** Voice identified as the First Officer
- **-3** Voice identified as a Flight Attendant
- **-?** Voice unidentified

MZT Radio transmission from Mazetlan Center

LAX CTR1 Radio transmission from the Los Angeles Air Route Traffic Control Center sector 30 controller

LAX CTR2 Radio transmission from the Los Angeles Air Route Traffic Control Center sector 25 controller

LAX-MX Radio transmission from Alaska Airlines Maintenance facility in Los Angeles

LAX-OPS Radio transmission from Alaska Airlines Operations facility in Los Angeles

SEA-DIS Radio transmission from Alaska Airlines Dispatch facility in Seattle

SEA-MX Radio transmission from Alaska Airlines maintenance facility in Seattle
- **-1** First voice
- **-2** Second voice

[1] This recording contained some audio from one Hot microphone. The voices or sounds heard on this channel were also heard on the CAM channel, and are annotated as coming from the CAM channel in this transcript. The audio from the HOT microphone was used to clarify the CAM audio when possible.

ATIS	Radio transmission from Los Angeles airport Automated Terminal Information System
CAWS	Mechanical voice or sound source from the Central Aural Warning System, as heard on the Cockpit Area Microphone channel.
*****	Unintelligible word
@	Non-pertinent word
#	Expletive
- - -	Break in continuity or interruption in comment
( )	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.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
Start of Transcript			
1549:49.3 [start of recording]			
		1549:50 SEA-MX	um beyond that I have verified no history on your aircraft in the past thirty days.
1549:54.8 CAM	[sound of click]		
		1549:57.7 RDO-1	yea we didn't see anything in the logbook.
1550:14 CAM-2	why don't you pull your your seat forward and I'll just check this pedestal back there. I don't think there's anything beyond that we haven't checked.		
1550:22 CAM-1	see when he's saying pedestal... I believe he's talking about this---		
1550:25 CAM-2	oh.		
1550:25 CAM-1	---switch that's on the * that's on the pedestal.		
1550:27 CAM-2	yea okay.		
1550:31 CAM-1	do you see anything back there?		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1550:32 CAM	[Sound of click]		
1550:33 CAM-2	uh there's *.		
		1550:40 SEA-MX	and two sixty one, maintenance.
		1550:42.0 RDO-1	go ahead maintenance two six one.
		1550:44 SEA-MX	understand you're requesting uh diversion to L A for this uh discrepancy is there a specific reason you prefer L A over San Francisco?
		1550:45 MZT	Alaska two sixty one radar service terminated... contact uh Los Angeles center frequency one one nine decimal ninety five good day.
		1550:54.4 RDO-1	well a lotta times its windy and rainy and wet in San Francisco and uh, it seemed to me that a dry runway... where the wind is usually right down the runway seemed a little more reasonable.
		1550:55.0 RDO-2	one one nine ninety five Alaska two sixty one.
		1551:01.2 RDO-2	say again the frequency one one nine point eh ninety five?

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1551:05 MZT	affirm one one nine decimal ninety five.
		1551:09.3 RDO-2	roger.
		1551:09.9 SEA-MX	ok and uh… is this added fuel that you're gonna have in L A gonna be a complication or an advantage?
		1551:18.1 RDO-1	well the way I'm reading it uh heavier airplanes land faster... right now I got fifteen five on board, I'm thinking to land with about twelve which is still uh an hour and forty minutes... uh and those are the numbers I'm running up here.
		1551:20.6 RDO-2	L A Alaska two sixty one three one zero.
		1551:36 SEA-MX	ok uh two sixty one standby for dispatch.
		1551:38 RDO-2	Los Angeles Alaska two sixty one three one zero.
		1551:40 RDO-1	OK the other thing you gotta know is that they're talking about holding and delays in San Francisco um for your maintenance facil- eh you know planning uh it uh L A seemed like a smarter move from airworthy move.
		1551:42 LAX-CTR1	Alaska two sixty one L A center roger.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1551:50 RDO-2	* there's two people on the frequency I'm sorry Alaska two sixty one I didn't hear your response.
		1551:58 LAX-CTR1	Alaska two six one squawk two zero one zero.
		1552:01 RDO-2	two zero one zero Alaska two sixty one.
		1552:02 SEA-DIS	two sixty one dispatch... uh current San Francisco weather one eight zero at six, nine miles, few at fifteen hundred broken twenty eight hundred overcast thirty four hundred... uh if uh you want to land at L A of course for safety reasons we will do that uh wu we'll uh tell you though that if we land in L A uh we'll be looking at probably an hour to an hour and a half we have a major flow program going right now. uh that's for ATC back in San Francisco.
		1552:31 RDO-1	well uh yu you eh huh... boy you put me in a spot here um….
		1552:41 RDO-1	I really didn't want to hear about the flow being the reason you're calling us cause I'm concerned about overflying suitable airports.
		1552:51 SEA-DIS	well we wanna do what's safe so if that's what you feel is uh safe we just wanna make sure you have all of the uh… all the info.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1552:59 RDO-1	yea we we kinda assumed that we had... what's the uh the wind again there in San Francisco?
		1553:03 SEA-DIS	wind at San Francisco currently zero uh one zero eight at six.
1553:08 CAM-2	what runway they landing… one zero?		
1553:09 CAM-1	what's that?		
1553:10 CAM-2	ask him what runway they're landing.		
		1553:11 RDO-1	and confirm they're landing runway one zero?
		1553:15 SEA-DIS	and uh standby I'll confirm that.
1553:17 CAM-2	and see if the runways are dry or wet.		
		1553:19 RDO-1	and we need to know if they're dry or wet.
		1553:21 SEA-DIS	eh yup I'll uh find that out and uh correction on that wind one eight zero at six and standby.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1553:28 CAM-1	one eight zero at six... so that's runway one six what we need is runway one nine, and they're not landing runway one nine.		
1553:35 CAM-2	I don't think so.		
1553:37 CAM-2	we might just ask if there's a ground school instructor there available and and discuss it with him... or a uh simulator instructor.		
1553:40 CAM-1	yea.		
		1553:46 RDO-1	and uh dispatch one sixty one… we're wondering if we can get some support out of the uh instructernal force---
		1553:53 RDO-1	---instructors up there if they got any ideas on us.
1554:23 CAM-1	you're talkin to ATC huh?		
1554:24 CAM-2	yea uh huh.		
1554:26 CAM-2	well lets confirm the route of flight its uh, I wasn't totally sure but its uh direct Oceanside?		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1554:32 CAM-1	Tijuana Oceanside... Oceanside right... then Santa Catalina.		
1554:47 CAM-1	ehh somebody was callin in about wheelchairs---		
1554:50 CAM-3	oh really?		
1554:50 CAM-1	---when I'm workin a problem.		
1554:51 CAM-3	is that why it went static?		
1554:53 CAM-1	ok yea now... I just that's something that oughta be in the computers, if they want it that bad they you guys oughta be able to pick up the phone---		
1555:00 CAM-3	mmm hmm.		
1555:00 CAM-1	---just… drives me nuts. not that I wanna go on about it… you know I it just blows me away they think we're gonna land, they're gonna fix it, now they're worried about the flow, I'm sorry this airplane's idn't gonna go anywhere for a while.… so you know.		
1555:16 CAM-3	so they're trying to put the pressure on you---		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1555:18 CAM-1	well no, yea.		
1555:19 CAM-3	---well get it to where it needs to be.		
1555:20 CAM-1	and actually it doesn't matter that much to us.		
1555:23 CAM-3	still not gonna go out on time to the next *.		
1555:24 CAM-1	yea… yea… I thought they'd cover the people better from L A---		
1555:29 CAM-3	L A		
1555:30 CAM-1	---then San Francisco.		
		1555:32 RDO-2	L A Alaska two sixty one just confirm our routing after uh Tijuana is, direct Oceanside?
		1555:38 LAX-CTR1	Alaska two sixty one after Tijuana cleared to San Francisco via direct San Marcos jet five zero one Big Sur direct maintain flight level three one zero.
		1555:47 RDO-2	OK uh San Francisco San Marcos J five zero one Big Sur uh direct three one zero Alaska two sixty one.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1555:55 LAX-CTR1	*
		1556:03 SEA-DIS	Alaska two sixty one dispatch.
		1556:06 RDO-1	dispatch Alaska two six one go ahead.
		1556:08 SEA-DIS	yea I called uh ATIS they're landing two eight right two eight left and uh wasn't able to get the the runway report but uh looking at past uh weather it hasn't rained there in hours so I'm looking at uh probably a dry runway.
		1556:21 RDO-1	ok uh.
		1556:26 RDO-1	I have with the information I have available to me and we're waitin on that CG update I'm looking at a uh approach speed of a hundred and eighty knots, uh do you have a wind at L A X lax?
		1556:50 SEA-DIS	its two six zero at nine.
		1556:56 RDO-1	ok two six at nine….
		1556:59 RDO-1	...versus a direct crosswind which is effectively no change in groundspeed... I gotta tell you, when I look at it from a safety point I think that something that lowers my ground-speed makes sense.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1557:16 SEA-DIS	ok two sixty one that'll uh that'll mean L A X then for you um I was gonna get you if I could to call L A X with that uh info and they can probably whip out that CG for you real quick.
		1557:30 RDO-1	I suspect that uh that's what we'll have to do. ok here's uh, my plan is we're gonna continue as if going to San Francisco get all that data then begin our descent back in to L A X, and at a lower altitude we will configure, and check the handling uh envelope before we proceed with the approach.
		1558:05 SEA-DIS	ok two sixty one dispatch copied that, if you can now keep uh L A ops updated on uh your ETA, that would be great and I'll be talking with them.
		1558:15 RDO-1	ok well ah if you'll let them know we're comin here I'll I think they'll probably listen as we talk… were goin to L A X were gonna stay up here and burn a little more gas get all our ducks in a row, and then we'll uh be talking to L A X when we start down to go in there.
		1558:29 SEA-DIS	ok and if you have any problems with them giving you a CG gimme a call back.
		1558:34 RDO-1	ok. break, L A X do you read Alaska two six one?
		1558:39 LAX-OPS	two sixty one I do copy do you have an ETA for me?

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1558:43 RDO-1	well….
		1558:45 RDO-1	...yea I'm gonna put it at about thirty, thirty five minutes, I could actually, the longer the more fuel I burn off the better I am... but I wonder if you can compute our current CG based on the information we had at takeoff for me.
		1558:58 LAX-OPS	ok you're transmission is coming in broken but uh, go ahead.
		1559:02 RDO-1	you know what I'll wait a minute we'll be a little bit closer and that'll help everything.
		1559:06 LAX-OPS	ok also uh two sixty one just be advised uh because you're an international arrival we have to get landing rights I don't know how long that's gonna take me... but uh I have to clear it all through customs first.
		1559:19 RDO-1	ok I unders... I remember this is complicated, yea well, better start that now cause we are comin to you.
		1559:26 LAX-OPS	copy.
1559:29 CAM-1	we'll call em back over as we get closer to Catalina.		
1559:34 CAM-2	as we get what?		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1559:34 CAM-1	closer to L A she's got to get landing rights.		
1559:37 CAM-2	were ninety four miles from L A now.		
1559:38 CAM-1	oh ok. you wanna listen to the ATIS you can.		
1559:42 CAM-2	in fact I switched it once already just kinda late.		
1559:44 CAM-1	you got the jet.		
1559:44 CAM-2	I got it.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1559:50 ATIS	charlie five and charlie six is restricted * taxiway charlie five is restricted to MD eleven and smaller. read back all runway hold short instructions. upon receipt of your ATC clearance read back only your callsign and transponder code unless you have a question. advise on initial contact, you have information mike. Los Angeles international airport information mike. two two five zero zulu. wind two three zero at eight. visibility eight. few clouds at two thousand eight hundred. one two thousand scattered. ceiling two zero thousand overcast. temperature one six dewpoint one one. altimeter three zero one seven. simultaneous ILS approaches in progress runway two four right and two five left or vector for visual approach will be provided. simultaneous visual approaches to all runways are in progress. and parallel localizer approaches are in progress between Los Angeles international and Hawthorne airports. simultaneous instrument departure in progress runway two four and two five. notices to airmen.
1601:01 CAM-2	so he wanted us to go to San Fran initially?		
1601:06 CAM-1	to keep the schedule alive. I mean it was just... it was I mean he had all the reasons to do it, I stated concern about flying overflying a suitable airport---		
1601:15 CAM-2	yea.		
1601:16 CAM-1	---but I was listening, then when he gives me the wind, its it's... the wind was a ninety degree cross at ten knots. two eight and we'd be landing on---		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1601:30 CAM-2	and they are using one nine?		
1601:33 CAM-1	you know I don't know… I wrote it down there… the winds were… one eighty at six… I don't know.		
1601:49 CAM-2	I don't know.		
1601:49 CAM-1	I don't care… you know what? I expect him to figure all that # ---		
1601:53 CAM-2	right.		
1601:53 CAM-1	---he's got it on the screen---		
1601:54 CAM-2	that's why I was thinking that an instructor would really uh---		
1601:58 CAM-1	yea.		
1601:58 CAM-2	---cut through the crap there.		
1601:59 CAM-2	they… not available?		
1602:00 CAM-1	well they just don't talk to each other.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1602:02 CAM-2	oh.		
1602:02 CAM-1	I mean I * ---		
1602:04 CAM-2	* they've always told us they were available you know---		
1602:06 CAM-1	yea yea.		
1602:07 CAM-2	---anytime you have a problem.		
1602:09 CAM-2	if they get one down there.		
		1602:12.6 RDO-1	Los Angeles one sixty one do you read me better now?
1602:29 CAM-1	I got the track goin over there.		
		1602:31 LAX-OPS	go ahead two six one.
		1602:33.6 RDO-1	two sixty one, I… I know you're busy on us uh, but we're discussing it up here could you give us the winds at San Francisco if you could just pull em up on your screen?
1602:57 CAM-2	I thought they….		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1603:00 LAX-OPS	ok ahhh San Francisco, ok we've got uh... winds are one seventy at six knots.
		1603:15.6 RDO-1	ok thank you that's what I needed. we are comin in to see you… and I've misplaced the paperwork here.
1603:23 CAM-2	there it is.		
1603:35 CAM-1	I can't read your writing… can you read her the uh zero fuel weight---		
1603:40 CAM-2	yea.		
1603:41 CAM-1	---and all those numbers and CG.		
		1603:43 LAX-OPS	L A operations from two six to two six one.
1603:48 CAM-2	I got it.		
		1603:48.5 RDO-2	uhhh two sixty one… do you need our uh, our numbers?
		1603:52 LAX-OPS	yea we just wanna advise that we do not have landing rights as yet.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1603:56 RDO-2	here's our numbers we had uh ten in first class, seventy in coach, zero fuel weight one zero two one one zero point one fuel on board thirty four point niner take off weight one thirty six five one one point eight, CG eleven point eight.
		1604:19 LAX-OPS	OK I got ten and seventy Z fuel weight one zero two one one zero point one, fuel on board thirty four decimal nine take off weight five one one decimal eight and a CG of eleven decimal eight.
		1604:32 RDO-2	yea uh take off one three six five one one point eight and uh CG one one point eight. and we currently have thirteen thousand six hundred pounds of fuel on board.
1604:43 CAM-1	estimate ten thousand on landing.		
		1604:45 RDO-2	estimating ten thousand pounds on landing.
		1604:53 LAX-OPS	ok you said your takeoff weight was… one one uhh one five one one decimal eight?
		1604:58 RDO-2	one three six five one one point eight.
		1605:05 LAX-OPS	one three six five one one point eight thank you.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1605:07 RDO-2	and we're currently a hundred and fifteen seven on our weight, and we'll burn another three thousand pounds.
1605:19 CAM	[sound of two clicks]		
1605:27 CAM-2	I'm back on the uh I'm off of the uh company.		
1606:26 CAM-1	no… that's what I was expecting them to do. duh.		
1606:47 CAM-2	so our… actually our landing speed will be one forty eight plus… some additive right?		
1607:06 CAM-1	lets guess... lets guess one twelve.		
1607:10 CAM-2	ok.		
1607:10 CAM-1	one forty six… plus… I get a minus two, worst case... twenty four knots... fifty sixty seventy... *.		
		1607:33 LAX-OPS	Alaska two sixty one from operations can you give us your tail number?
		1607:38 RDO-1	uh two sixty one, it was ship number nine six three.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1607:43 LAX-OPS	copy that two… uh your aircraft number is nine six three.
		1607:47 RDO-1	affirmative thank you.
		1607:51 LAX-MX-1	and two sixty one maintenance.
		1607:53 RDO-1	two sixty one go.
		1607:54 LAX-MX-1	yea are you guys with the uh, horizontal situation?
		1607:58 RDO-1	affirmative.
		1607:59 LAX-MX-1	yea did you try the suitcase handles and the pickle switches right?
		1608:03 RDO-1	yea we tried everything together, uh….
		1608:08 RDO-1	...we've run just about everything if you've got any hidden circuit breakers we'd love to know about 'em.
		1608:14 LAX-MX-1	I'm off I'll look at the uh circuit breaker uh guide just as a double check and um yea I just wanted to know if you tried the pickle switches and the suitcase handles to see if it was movin in with any of the uh other switches other than the uh suitcase handles alone or nothing.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1608:29.9 RDO-1	yea we tried just about every iteration.
		1608:32 LAX-MX-1	and alternate's inop too huh?
		1608:35.1 RDO-1	yup its just it appears to be jammed the uh the whole thing, it spikes out when we use the primary, we get AC load that tells me the motor's tryin to run but the brake won't move it. when we use the alternate, nothing happens.
		1608:50 LAX-MX-1	ok and you you you say you get a spike when on the meter up there in the cockpit when you uh try to move it with the uh um with the primary right?
1608:59 CAM-1	I'm gonna click it off you got it.		
1609:00 CAM-2	ok.		
		1609:01.5 RDO-1	affirmative we get a spike when we do the primary trim but there's no appreciable uh change in the uh electrical uh when we do the alternate.
		1609:09 LAX-MX-1	ok thank you sir see you here.
		1609:11 RDO-1	ok.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1609:13 CAM-1	lets do that.		
1609:14.8 CAM	[sound of click]		
1609:14.8 CAM-1	this'll click it off.		
1609:16 CAM	[sound of clunk]		
1609:16.9 CAM	[sound of two faint thumps in short succession]		
1609:17.0 CAWS	[sound similar to horizontal stabilizer-in-motion audible tone]		
1609:18 CAM-1	holy #.		
1609:19.6 CAWS	[sound similar to horizontal stabilizer- in-motion audible tone]		
1609:21 CAM-1	you got it?... # me.		
1609:24 CAM-2	what are you doin?		
1609:25 CAM-1	I it clicked off---		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1609:25.4 CAWS	[sound of chime] Altitude		
1609:26 CAM-1	---it * got worse… ok.		
1609:30 CAM	[sound similar to airframe vibration begins]		
1609:31 CAM-1	you're stalled.		
1609:32 CAM	[sound similar to airframe vibration becomes louder]		
1609:33 CAM-1	no no you gotta release it ya gotta release it.		
1609:34 CAM	[sound of click]		
1609:34 CAM	[sound similar to airframe vibration ends]		
1609:42.4 CAM-1	lets * speedbrake.		
1609:46 CAM-1	gimme a high pressure pumps.		
1609:52 CAM-2	ok.		
1609:52 CAM-1	help me back help me back.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1609:54 CAM-2	ok.		
		1609:55 RDO-1	center Alaska two sixty one we are uh in a dive here.
		1610:01.6 RDO-1	and I've lost control, vertical pitch.
1610:01.9 CAWS	[sound of clacker] Overspeed. (begins and repeats for approx 33 seconds)		
		1610:05 LAX-CTR1	Alaska two sixty one say again sir.
		1610:06.6 RDO-1	yea were out of twenty six thousand feet, we are in a vertical dive… not a dive yet... but uh we've lost vertical control of our airplane.
1610:15 CAM	[sound of click]		
1610:20 CAM-1	just help me.		
1610:22 CAM-1	once we get the speed slowed maybe… we'll be ok.		
		1610:28.2 RDO-1	we're at twenty three seven request uh.
		1610:33 RDO-1	yea we got it back under control here.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1610:34 RDO-2	no we don't, ok.
1610:37 CAM-1	ok.		
		1610:37 LAX-CTR1	the altitude you'd like to uh to remain at?
1610:40 CAM	[sound of click]		
1610:45 CAM-2	lets take the speedbrakes off I'm * ---		
1610:46 CAM-1	no no leave them there. it seems to be helping.		
1610:51 CAM-1	# me.		
1610:53 CAWS	[sound of chime] Altitude		
1610:55 CAM-1	ok it really wants to pitch down.		
1610:58 CAM-2	ok.		
1610:59 CAM-1	don't mess with that.		
1611:04 CAM-2	I agree with you.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1611:04 LAX-CTR1	Alaska two sixty one say your condition.
		1611:06.6 RDO-1	two sixty one we are at twenty four thousand feet, kinda stabilized.
		1611:10 RDO-1	we're slowing here, and uh, we're gonna uh.
		1611:15 RDO-1	do a little troubleshooting, can you gimme a block between uh, twenty and twenty five?
		1611:21 LAX-CTR1	Alaska two sixty one maintain block altitude flight level two zero zero through flight level two five zero.
		1611:27 RDO-1	Alaska two sixty one we'll take that block we'll be monitor'n the freq.
1611:31 CAM-2	you have the airplane let me just try it.		
1611:33 CAM-1	ok.		
1611:33 CAM-2	uh how hard is it?		
1611:33 CAM-1	I don't know my adrenaline's goin… it was really tough there for a while.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1611:38 CAM-2	yea it is.		
1611:39 CAM-1	ok.		
1611:43 CAM-2	whatever we did is no good, don't do that again.		
1611:44 CAM-1	yea, no it went down it went to full nose down.		
1611:48 CAM-2	uh it's a lot worse than it was?		
1611:50 CAM-1	yea yea we're in much worse shape now.		
1611:59 CAM-1	I think its at the stop, full stop… and I'm thinking, we can-can it go any worse… but it probably can… but when we slowed down, lets slow it lets get down to two hundred knots and see what happens.		
1612:16 CAM-2	ok?		
1612:16 CAM	[sound of click]		
1612:17 CAM-2	we have to put the slats out and everything… flaps and slats.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1612:20 CAM-1	yea... well we'll wait ok you got it for a second?		
1612:23 CAM-2	yea.		
		1612:25.3 RDO-1	maintenance two sixty one are you on?
		1612:30 LAX-MX-2	yea two sixty one this is maintenance.
		1612:32.0 RDO-1	ok we did---
		1612:33.2 RDO-1	---we did both the pickle switch and the suitcase handles and it ran away full nose trim down.
		1612:39 LAX-MX-2	oh it ran away trim down.
		1612:42 RDO-1	and now we're in a * pinch so we're holding uh we're worse than we were.
		1612:50 LAX-MX-2	ok uh... geez.
		1612:52 LAX-MX-1	you want me to talk to em? (in the background during previous transmission)

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1612:55 LAX-MX-1	yea two sixty one maintenance uh uh you getting full nose trim down but are you getting any you don't get no nose trim up is that correct?
		1613:04 RDO-1	that's affirm we went to full nose down and I'm afraid to try it again to see if we can get it to go in the other direction.
		1613:10 LAX-MX-1	ok well your discretion uh if you want to try it, that's ok with me if not that's fine. um we'll see you at the gate.
1613:20 CAM-2	did it happen went in reverse? when you pulled back it went forward?		
1613:22 CAM-1	I went tab down… right, and it should have come back instead it went the other way.		
1613:29 CAM-2	uh huh.		
1613:30 CAM-1	what do you think?		
1613:32 CAM-2	uhhh.		
1613:32 CAM-1	you wanna try it or not?		
1613:32 CAM-2	uhh no. boy I don't know.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1613:33 CAM-1	its up to you man.		
1613:35 CAM-2	lets head back toward uh here lets see… well we're---		
1613:39 CAM-1	I like where were goin out over the water myself… I don't like goin this fast though.		
1613:50 CAM	[sound of click]		
1613:57 CAM-1	ok you got * [sound similar to short interruption in recording] second?		
1613:58 CAM-2	yea.		
1613:59 CAM-2	we better... talk to the people in the back there.		
1614:03 CAM-1	yea I know.		
		1614:04 LAX-CTR1	Alaska two sixty one let me know if you need anything.
		1614:08 RDO-2	yea we're still workin this.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1614:12 PA-1	folks we have had a flight control problem up front here we're workin it uh that's Los Angeles off to the right there that's where we're intending to go. we're pretty busy up here workin this situation I don't anticipate any big problems once we get a couple of sub systems on the line. but we will be going into L A X and I'd anticipate us parking there in about twenty to thirty minutes.		
1614:39 CAM-1	ok… did the, first of all, speedbrakes. did they have any effect?		
1614:49 CAM-1	lets put the power where it'll be for one point two, for landing. you buy that?		
1614:53 CAM-1	slow it down and see what happens.		
		1614:54 LAX-CTR1	Alaska two sixty one contact L A center one two six point five two they are aware of your situation.
		1615:00.0 RDO-2	ok Alaska two sixty one say again the frequency, one two zero five two?
1615:02 CAM-1	I got the yoke.		
		1615:04 LAX-CTR1	Alaska two sixty one, twenty six fifty two.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1615:06 RDO-2	thank you.
		1615:07 LAX-CTR1	you're welcome have a good day.
		1615:19.7 RDO-2	L A Alaska two sixty one we're with you we're at twenty two five, we have a jammed stabilizer and we're maintaining altitude with difficulty. uh but uh we can maintain altitude we think... and our intention is to land at Los Angeles.
		1615:36 LAX-CTR2	Alaska two sixty one L A center roger um you're cleared to Los Angeles airport via present position direct uh Santa Monica, direct Los Angeles and uh, you want lower now or what do you want to do sir?
1615:54 CAM-1	let me get let me have it.		
		1615:56 RDO-1	center uh Alaska two sixty one. I need to get down about ten, change my configuration, make sure I can control the jet and I'd like to do that out here over the bay if I may.
		1616:07 LAX-CTR2	ok Alaska two sixty one roger that standby here.
1616:11 CAM-2	lets do it at this altitude instead---		
1616:11 CAM-1	what?		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1616:12 CAM-2	---of goin to ten lets do it at this altitude.		
1616:14 CAM-1	cause the airflow's that much difference down at ten this air's thin enough that that you know what I'm sayin?		
1616:20 CAM-2	yea uh I'll tell em to uh---		
1616:22 CAM-1	I just made a PA to everyone to get everybody---		
1616:24 CAM-2	ok.		
1616:26 CAM-1	---down you might call the flight attendants.		
1616:27 CAM	[sound similar to cockpit door operating]		
1616:32 CAM-3	I was just comin up this way.		
		1616:32 LAX-CTR2	Alaska two sixty one fly a heading of two eight zero and descend and maintain one seven thousand.
1616:34 CAM-2	uhh.		
1616:36 CAM	[sound similar to cockpit door operating]		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
		1616:39.0 RDO-1	two eight zero and one seven seventeen thousand Alaska two sixty one. and we generally need a block altitude.
		1616:45 LAX-CTR2	ok and just um I tell you what do that for now sir, and contact L A center on one three five point five they'll have further uhh instructions for you sir.
		1616:56.9 RDO-2	ok thirty five five say the altimeter setting?
		1616:59 LAX-CTR2	the L A altimeter is three zero one eight.
1617:01 CAM-1	I need everything picked up---		
		1617:02 RDO-2	thank you.
1617:02 CAM-1	---and everybody strapped down---		
1617:04 CAM-3	ok.		
1617:04 CAM-1	---cause I'm gonna unload the airplane and see if we can---		
1617:06 CAM-3	ok.		
1617:07 CAM-1	---we can regain control of it that way.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1617:09 CAM-3	ok we had like a big bang back there---		
1617:11 CAM-1	yea I heard it---		
1617:12 CAM-3	ok.		
1617:12 CAM-1	---the stab trim I think it---		
1617:13 CAM-2	you heard it in the back?		
1617:13 CAM-3	yea.		
1617:14 CAM-2	yea.		
1617:15 CAM-3	so---		
1617:15 CAM-1	I think the stab trim thing is broke---		
1617:17 CAM-3	---I didn't wanna call you guys… but---		
1617:18 CAM-1	no no that's good.		
1617:20 CAM-3	---that girl, they're like you better go up there---		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1617:21 CAM-1	I need you everybody strapped in now, dear.		
1617:22 CAM-3	---and tell them.		
1617:23 CAM-3	ok.		
1617:24 CAM-1	cause I'm gonna I'm going to release the back pressure and see if I can get it... back.		
1617:30 CAM	[sound similar to cockpit door operating]		
1617:33 CAM-2	three zero one eight.		
1617:37 CAM-1	I'll get it here.		
1617:40 CAM-2	I don't think you want any more speedbrakes do you?		
1617:42 CAM-1	uhh no. actually.		
1617:46 CAM-2	he wants us to maintain seventeen.		
1617:51 CAM-1	ok I need help with this here.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1617:52 CAM-1	slats ext... lets---		
1617:54 CAM-2	ok slats---		
1617:54 CAM-1	gimme slats extend.		
1617:55 CAM-2	got it.		
1617:56.6 CAM	[sound similar to slat/flap handle movement]		
1617:58 CAM-1	I'm test flyin now---		
1617:59 CAM-2	how does it feel?		
1618:00 CAM-1	it's wantin to pitch over more on you.		
1618:02 CAM-2	really?		
1618:03 CAM-1	yea.		
1618:04 CAM-2	try flaps?… fifteen, eleven?		
1618:05 CAM-1	ahh lets go to eleven.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1618:07.3 CAM	[sound similar to slat/flap handle movement]		
1618:09 CAM-2	ok... get some power on.		
1618:10 CAM-1	I'm at two hundred and fifty knots, so I'm lookin….		
1618:17 CAM-2	real hard?		
1618:17 CAM-1	no actually its pretty stable right here... see but we got to get down to a hundred an eighty.		
1618:26 CAM-1	OK... bring bring the flaps and slats back up for me.		
1618:32 CAM-2	slats too?		
1618:33 CAM-1	yea.		
1618:36.8 CAM	[sound similar to slat/flap handle movement]		
1618:37 CAM-2	that gives us... twelve thousand pounds of fuel, don't over boost them.		
1618:47 CAM-1	what I'm what I wanna do...		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1618:48 CAM	[sound similar to slat/flap handle movement]		
1618:49 CAM-1	is get the nose up... and then let the nose fall through and see if we can stab it when it's unloaded.		
1618:54 CAWS	[sound of chime] Altitude (repeats for approximately 34 seconds)		
1618:56 CAM-2	you mean use this again? I don't think we should... if it can fly, its like---		
1619:01 CAM-1	it's on the stop now, its on the stop.		
1619:04 CAM-2	well not according to that its not.		
1619:07 CAM-2	the trim might be, and then it might be uh, if something's popped back there---		
1619:11 CAM-1	yea.		
1619:11 CAM-2	---it might be * mechanical damage too.		
1619:14 CAM-2	I think if it's controllable, we oughta just try to land it---		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1619:16 CAM-1	you think so? ok lets head for L A.		
1619:21.1 CAM	[sound of faint thump]		
1619:24 CAM-2	you feel that?		
1619:25 CAM-1	yea.		
1619:29 CAM-1	ok gimme sl--- see, this is a bitch.		
1619:31 CAM-2	is it?		
1619:31 CAM-1	yea.		
1619:32.8 CAM	[sound of two clicks similar to slat/flap handle movement]		
1619:36 CAM-?	*		
1619:36.6 CAM	[sound of extremely loud noise] [increase in background noise begins and continues to end of recording] [sound similar to loose articles moving around in cockpit]		
1619:37 CAM-?	*		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1619:37.6 PA	[sound similar to CVR startup tone]		
1619:43 CAM-2	mayday.		
1619:49 CAM-1	push and roll, push and roll.		
1619:54 CAM-1	ok, we are inverted... and now we gotta get it….		
1619:59 CAM	[sound of chime]		
1620:03 CAM-1	kick *		
1620:04 CAM-1	push push push... push the blue side up.		
1620:14 CAM-1	push.		
1620:14 CAM-2	I'm pushing.		
1620:16 CAM-1	ok now lets kick rudder... left rudder left rudder.		
1620:18 CAM-2	I can't reach it.		
1620:20 CAM-1	ok right rudder... right rudder.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1620:25 CAM-1	are we flyin?... we're flyin... we're flyin... tell 'em what we're doin.		
1620:33 CAM-2	oh yea let me get *		
1620:35 CAM-1	*		
1620:38 CAM-1	gotta get it over again... at least upside down we're flyin.		
1620:40.6 PA	[sound similar to CVR startup tone]		
1620:42 CAM-?	*		
1620:44 CAM-?	*		
1620:49 CAM	[sounds similar to compressor stalls begin and continue to end of recording]		
1620:49 CAM	[sound similar to engine spool down]		
1620:54 CAM-1	speedbrakes.		
1620:55.1 CAM-2	got it.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME and SOURCE	**CONTENT**	**TIME and SOURCE**	**CONTENT**
1620:56.2 CAM-1	ah here we go.		
1620:57.1 [end of recording]			

End of transcript