

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



GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

DCA06FA058

**By
Christopher Babcock**

WARNING

The reader of this report is cautioned that the transcription of a cockpit voice recorder audio recording is not a precise science but is the best product possible from a Safety Board group investigative effort. The transcript or parts thereof, if taken out of context, could be misleading. The transcript should be viewed as an 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 Recorder Division

Washington, D.C. 20594

June 25, 2007

Cockpit Voice Recorder - 12

Group Chairman's Factual Report By Christopher Babcock

A. EVENT

Location: Memphis, Tennessee
Date: July 28, 2006, 11:25 CDT
Aircraft: MD-10, N391FE
Operator: FedEx, Flight 630
NTSB Number: DCA06FA058

B. GROUP A group was convened on July 31, 2006.

Chairman: Erin Gormley¹
National Transportation Safety Board

Member: Robert Drake
Air Safety Investigator
Federal Aviation Administration

Member: Harold Sieglinger
Chief Pilot
Boeing Company

Member: Patrick J. Ash
Air Safety Representative
Air Line Pilot's Association

Member: Ryan Swah
Senior Manager, Flight Standards
FedEx

¹ Ms. Gormley presided over the group meeting and transcript development but was not available to prepare the factual report.

C. SUMMARY

On July 28, 2006, a MD-10, registration N391FE, operated by FedEx as flight number 630 received substantial damage when the left main landing gear failed during landing at the Memphis International Airport in Memphis, TN. The left engine separated from the pylon and there was damage and fire to the left wing. The Part 121 domestic cargo flight originated from Seattle, WA, and was enroute to Memphis International Airport, Memphis, TN.

A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout. The CVR group meeting convened on July 31, 2006, and a transcript was prepared for the final 30 minutes of the 2-hour, 1-minute, 13-second digital recording (see attached).

D. DETAILS OF INVESTIGATION

On July 28, 2006, the NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **Honeywell 6022 SSCVR 120**
Recorder Serial Number: **04845**

Recorder Description

Per Federal regulation, CVRs record a minimum of the last 30 minutes of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes or two hours of CVR operation, depending on the CVR model. This model CVR, the Honeywell 6022 SSCVR 120, is a solid-state CVR that records two hours of digital cockpit audio. Specifically, it contains a two-channel recording of the last two hours of operation and separately contains a four-channel recording of the last 30 minutes of operation. The two-hour portion of the recording is comprised of one channel of audio information from the cockpit area microphone (CAM) and one channel that combines two audio sources: the Captain's audio panel information and the First Officer's audio panel information. The 30-minute portion of the recording contains four channels of audio data; one channel for each flight crew and one channel for the CAM audio information. One channel is not used in this recording

Recorder Damage

Upon arrival at the audio laboratory, it was evident that the CVR had not sustained any heat or structural damage and the audio information was extracted from the recorder normally, without difficulty.

Audio Recording Description

For the two-hour portion of the CVR recording, the CAM channel recording contained good quality² audio information, and the mixed flight crew channel contained excellent quality audio information. Table 1 shows the contents and quality of the four

² See attached CVR Quality Rating Scale.

channels in the 30-minute portion of the recording. Notably, channel number one did not contain any audio information (nor was it required by Federal regulations).

Table 1 Contents and quality of 30 minute recording

Channel number	Content/source	Quality
1	None	N/A
2	Captain Audio Panel	Excellent
3	First Officer Audio Panel	Excellent
4	Crew Area Microphone	Good

Timing and Correlation

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, radio transmissions that the aircraft made were correlated to the radio transmit microphone key parameter from the FDR. Once a correlation between the two recorders was established, a reference to local time was determined. The CVR and FDR times were offset to reflect the local central daylight time of the accident.

As part of the Safety Board's accident investigation process, the flight crew was invited to review the CVR transcript and suggest corrections or additions. They have not responded to the invitation.

Christopher Bbcock
Vehicle Recorder Division

CVR Quality Rating Scale

The levels of recording quality are characterized by the following traits of the cockpit voice recorder information:

Excellent Quality	Virtually all of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate only one or two words that were not intelligible. Any loss in the transcript is usually attributed to simultaneous cockpit/radio transmissions that obscure each other.
Good Quality	Most of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions that obscure each other.
Fair Quality	The majority of the crew conversations were intelligible. The transcript that was developed may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.
Poor Quality	Extraordinary means had to be used to make some of the crew conversations intelligible. The transcript that was developed may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio) or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.
Unusable	Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.

Transcript of a Honeywell 6022 SSCVR 120 solid-state cockpit voice recorder, serial number 04845, installed on a FedEx MD-10 (N391FE), which crashed after a landing gear collapse at Memphis International Airport, Memphis, TN.

LEGEND

CAM	Cockpit area microphone voice or sound source
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from N391FE
CTR	Radio transmission from Memphis center controller
APR	Radio transmission from the Memphis approach controller
TWR	Radio transmission from the Memphis International Airport tower controller
-1	Voice identified as the Captain
-2	Voice identified as the First Officer
-?	Voice unidentified
-A	Radio transmission from first Memphis center controller
-B	Radio transmission from second Memphis center controller
*	Unintelligible word
#	Expletive
@	Non-pertinent word
()	Questionable insertion
[]	Editorial insertion

Note 1: Times are expressed in Central daylight time (CDT).

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

TIME and SOURCE

CONTENT

0924:57.3
START OF RECORDING

1055:48.8
START OF TRANSCRIPT

1056:38.7
CAM-1 um spot seven or gate seven forty which is spot fourteen. I think I'll have ground power which is good. I said on the in range check that I sent I told 'em that we were pneumatic only.

1056:48.1
CAM-2 okay.

1056:53.4
CAM-1 but I want to write that up and I also want to write up the lav service.

1056:55.7
CAM-2 would you like me to get the book.

1056:58.3
CAM-1 you bet that would be great can you reach it if you can't I'll get up and get it.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

1056:16.4
RDO-1 Memphis center good morning FedEx six thirty flight level three three zero.

1056:22.9
MEM-A FedEx six thirty Memphis center roger.

1157:03.6
MEM-A FedEx six thirty cleared direct Gilmore Gilmore three arrival.

1057:06.9
RDO-1 direct Gilmore Gilmore three FedEx six thirty.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1057:09.9
CAM-1 direct Gilmore.

1057:10.8
CAM-2 Gilmore.

1057:47.7
CAM-2 you have Gilmore minus ten.

1057:51.4
CAM-1 perfect.

1058:00.9
CAM-1 three one oh.

1058:29.2
HOT-2 boy I was on on another planet there.

1058:33.1
CAM-1 good.

1058:33.8
HOT-2 that was uh a deep sleep.

1059:08.3
CAWS "altitude".

1059:11.5
HOT-2 *.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

1057:53.0
MEM-A FedEx six thirty descend and maintain flight level three one zero.

1057:56.9
RDO-1 three one oh FedEx six thirty out of three three oh.

INTRA-COCKPIT COMMUNICATION

TIME and
SOURCE

CONTENT

1100:04.5
CAM-1 two four zero.

1100:05.1
HOT-2 two four zero.

1100:39.8
CAM-1 all right lav needs service.

1100:50.3
HOT-2 you got the book there I'll help you out.

AIR-GROUND COMMUNICATION

TIME and
SOURCE

CONTENT

1059:57.4
MEM-A FedEx six thirty descend and maintain flight level two four zero.

1100:01.9
RDO-1 two four zero FedEx six thirty.

1100:41.8
MEM-A FedEx six thirty contact Memphis center one two zero point zero seven.

1100:46.5
RDO-1 one twenty oh seven FedEx six thirty so long.

1100:49.6
MEM-A so long.

1100:58.0
RDO-1 Memphis center good morning FedEx six thirty is eh out of three zero zero for two four zero.

1101:05.5
MEM-B FedEx six thirty cross one zero north of Gilmore and maintain one zero thousand.

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u>
	<u>CONTENT</u>		<u>CONTENT</u>
		1101:10.6 RDO-1	at ten north of Gilmore at one zero thousand FedEx six thirty.
1101:17.5 CAM-1	um ok during engine start APU must have dropped off the line * generator **.		
1101:27.3 HOT-2	would you uh like to talk about the approach.		
1101:29.0 CAM-1	certainly.		
1101:33.1 HOT-2	we got the Gilmore three on page six twenty.		
1101:37.7 CAM-1	okay.		
1101:38.3 HOT-2	my date is oh four two six or uh four may oh six weve been cleared to Gilmore ten short of Gilmore at ten and then uh where does Gilmore take us.		
1101:52.1 HOT-2	plus you've got BEERT BOWEN and then we go to ILS one eight right.		
1102:00.9 HOT-2	it's on page uh seven twenty.		
1102:02.9 HOT-1	'kay.		

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

1102:06.6
HOT-2 and uh stick in uh I-O-O-I for uh one eight one seven eight on the right hand side and then may go to the center so.

1102:18.5
HOT-1 that's closed.

1102:22.3
HOT-1 according to the a, to the ATIS it's closed.

1102:24.9
HOT-2 all right.

1102:28.7
HOT-2 so center's closed 'kay thank you * then we will put in the left on the left side.

1102:37.7
HOT-1 GOC this says k beck.

1102:45.9
HOT-1 that's uh should read that's from GOC.

1102:49.2
HOT-2 all right thank you.

1102:51.4
HOT-2 min safe twenty one hundred to the east twenty one hundred to the west twenty five hundred to the east twenty one hundred to the west we got uh BLEWS at four verti at eighteen hundred down to the minimums of uh five hundred baro cat one mins.

1103:03.9
HOT-1 'kay set.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u>
	<u>CONTENT</u>		<u>CONTENT</u>
1103:04.6 HOT-2	uh threshold crossing height is fifty two feet and uh lets see here for the missed approach based on the weather looks like we go straight ahead to nine hundred and over to WALSY at five thousand and hold at two hundred knots.		
1103:16.1 HOT-1	'right.		
1103:19.2 HOT-2	and that's about it for that lets do flaps thirty five since we're so light that's probably a better idea than flaps fifty.		
1103:24.8 HOT-1	sure yeah a lot better I agree.		
1103:28.4 HOT-2	manual braking sixty eight hundred feet uh landing distance.		
1103:33.2 HOT-2	FMS speed.		
1103:33.2 HOT-1	okay.		
1103:34.2 HOT-2	uh pretty standard.		
1103:36.4 HOT-1	um taxi back we get onto november somehow and then uh cross there at nine most likely and uh hang a hang a right on victor and a left up to spot fourteen.		
1103:46.2 HOT-1	right at the approach end.		

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1103:51.1
HOT-2 ok sounds good.

1103:51.9
HOT-1 it'll be the first uh spot there on the right once we get into spot fourteen.

1103:58.6
HOT-2 sounds great.

1104:00.2
HOT-1 all right.

1104:11.5
HOT-1 and uh when you give when you call them on the ground on taxi in can you tell them that we would like a maintenance consult uh maintenance to meet us at the airplane.

1104:22.8
HOT-2 okay.

1104:23.0
HOT-1 thanks.

1104:31.7
HOT-1 okay let me see if i can get a brand new they put out k beck but it oughta be time for papa.

1105:19.5
HOT-2 looks like winter out there doesn't it.

1105:20.8
HOT-1 does it really does but maybe maybe we will get a little rain through and maybe it'll uh clean out all this heat and air through here.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

1105:31.1

HOT-2 yeah.

1105:34.1

HOT-1 romeo now.

1105:35.4

HOT-2 'kay lets see what it's doing.

1105:37.5

HOT-1 two seventy thirteen gusts to eighteen cool.

1105:41.6

HOT-2 [sound similar to laughter]

1105:42.9

HOT-1 but they don't say anything about rain.

1105:44.6

HOT-2 well this will be the most crosswind I ever landed in as well.

1105:57.9

HOT-1 sad it doesn't say rain there.

1106:02.5

HOT-2 well based on the way the radar looked I mean it had to have rained.

1106:06.0

HOT-1 yeah.

1106:08.0

HOT-2 I hope so for the sake of your grass and your plants.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u>
	<u>CONTENT</u>		<u>CONTENT</u>
1106:12.7 HOT-1	that's right save my wallet 'cause I've been watering through the doggone meter.		
1106:18.8 HOT-2	do you you don't use well water to water.		
1106:22.1 HOT-1	no it's uh there's no well we're on rock.		
1106:24.9 HOT-2	oh you're on rock oh.		
1106:26.8 HOT-1	um so it's uh.		
1106:40.4 HOT-1	so we have to we have a septic tank everybody has septic.		
1106:46.1 HOT-2	yeah.		
1106:47.6 HOT-1	uh but everybody uses uh community water.		
1106:56.3 HOT-2	do you have a community septic field.		
1106:59.2 HOT-1	no it's not everybody's in their in their lot.		
1107:00.4 HOT-2	separate separate.		

INTRA-COCKPIT COMMUNICATION

TIME and
SOURCE

CONTENT

1107:56.7
HOT-2 it is funny I stopped moving around and I went to sleep.

1107:59.8
HOT-1 yeah.

1107:59.9
HOT-2 everything settles down I stopped sneezing as soon as I start moving around.

1108:03.0
HOT-1 isn't that weird.

1108:08.2
HOT-2 that's terrible, in range please ma'am.

1108:10.8
HOT-1 all right uh altimeters thirty fourteen.

1108:12.8
HOT-2 thirty fourteen.

1108:24.8
HOT-1 in range checks complete.

1109:25.6
HOT-2 getting a good wash.

1109:27.1
HOT-1 yeah.

1109:51.2
HOT-1 four oh six is Portland.

AIR-GROUND COMMUNICATION

TIME and
SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1110:08.2
HOT-1 looks like we're gonna pop out on the front side of this here.

1110:11.8
HOT-2 yep.

1110:18.0
HOT-2 yeah it's raining.

1110:19.0
HOT-1 pretty nice little rain I like that.

1111:20.5
HOT-2 good to me.

1111:21.8
HOT-1 plans coming together.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

1110:52.1
MEM-B FedEx six thirty contact approach one one niner point one.

1110:55.7
RDO-1 nineteen one FedEx six thirty good morning.

1111:05.5
RDO-1 Memphis approach good morning FedEx six thirty heavy is out of one two for one zero thousand romeo spot fourteen.

1111:14.6
APR FedEx six thirty heavy Memphis approach good morning runway one eight right.

1111:19.0
RDO-1 one eight right roger.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

1111:39.4
HOT-1 well they're givin' visual approaches into the into the airport.

1111:46.0
HOT-1 so we must pop out of the bottoms of this somewhere 'long.

1111:48.8
HOT-2 yeah.

1111:49.7
HOT-1 they're calling seventy five hundred.

1111:53.2
HOT-2 yep.

1111:58.9
HOT-2 I don't wanna do that let's go.

1112:12.0
HOT-2 how do ya get it to to accept your new speed after I tapped it in I thought you.

1112:17.8
HOT-1 well you're tappin' it too many times.

1112:19.6
HOT-2 oh that it.

1112:20.0
HOT-1 whaddy wanna.

1112:20.9
HOT-1 depending on what you want it to do.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and
SOURCE

CONTENT

1112:21.7

CAWS "altitude"

1112:24.2

HOT-1 uh eleven for ten.

1112:25.8

HOT-2 thank you.

1112:41.7

HOT-1 it's just not as sophisticated as the MD-11 as far as figuring out.

1112:46.5

HOT-2 yeah.

1112:46.9

HOT-1 ya know the MD-11 was built to be integrated with speed and pitch and uh.

1112:52.8

HOT-2 nice.

1112:53.5

HOT-1 and this has to its gotta its gotta think about it.

1112:57.3

HOT-2 part of the fact its the throttles right.

1112:59.4

HOT-1 yeah exactly.

1113:00.3

HOT-2 yeah.

AIR-GROUND COMMUNICATION

TIME and
SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1113:14.8
HOT-1 yep not a good day to go fly your aerobatic airplane.

1113:17.3
HOT-2 no not today I don't think I'd survive.

1113:32.9
HOT-2 BLEWS.

1113:38.6
HOT-1 NAVs available to BLEWS.

1113:39.8
HOT-2 all right taking the NAV.

1113:42.0
HOT-1 and five thousand.

1113:43.6
HOT-2 thank you.

1113:44.7
HOT-1 and how 'bout i give you BLEWS at four thousand so it can have something to look at.

1113:47.8
HOT-2 thank you.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

1113:20.7
APR FedEx six thirty heavy descend and maintain five thousand when you're able proceed direct to BLEWS.

1113:26.8
RDO-1 all right down to five thousand and direct BLEWS FedEx six thirty heavy we can do that.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1113:48.4
HOT-1 at instead of at or above.

1113:54.2
HOT-2 thank you.

1116:31.3
HOT-1 umhm.

1116:51.0
HOT-1 ah that river looks ghostly up through here doesn't it.

1116:54.0
HOT-2 oh yeah that's interesting.

1116:55.3
HOT-1 I think it's just the rain on our window ha.

1117:11.8
HOT-2 see if you get a chance approach checklist.

1117:14.6
HOT-1 certainly have a chance briefing is complete altimeters are thirty fourteen.

1117:19.7
HOT-2 thirty fourteen.

1117:20.9
HOT-1 minimums are five hundred baro.

1117:22.7
HOT-2 five hundred baro.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1117:24.4
HOT-1 nav aids are checked.

1117:26.1
HOT-1 approach check complete.

1117:39.6
CAWS "Altitude".

1117:47.1
HOT-1 three thousand.

1117:47.7
HOT-2 three thousand.

1118:10.0
HOT-2 in a situation like this.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

1117:36.0
APR FedEx six thirty heavy descend and maintain three thousand report the field in sight if you get it.

1117:41.1
RDO-1 and down to three thousand and uh we'll uh we got the airport in sight FedEx six thirty.

1117:56.3
RDO-1 FedEx uh six thirty heavy did ya copy we have the field in sight.

1117:59.6
APR FedEx six thirty heavy cleared visual approach runway one eight right.

1118:02.9
RDO-1 cleared for visual runway one eight right FedEx six thirty heavy.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1118:11.6

HOT-1 yeah.

1118:12.3

HOT-2 would ya cut it off a little bit just because.

1118:14.1

HOT-1 oh sure I would.

1118:16.6

HOT-1 we're cleared visual we can do what kinda one we want to.

1118:21.8

HOT-2 just don't get behind [sound similar to laughter]

1118:23.4

HOT-1 just don't get behind that's right.

1118:45.6

HOT-1 pretty strong wind outta the southwest up here at four thousand feet.

1118:51.5

HOT-2 yeah.

1118:55.0

HOT-1 it'll be what it'll be.

1119:03.3

HOT-1 looks like um looks like they gotta a little rain im seeing some looks like some streets are kinda damp. kinda hard to say I don't know Spain doesn't look like its got had too much.

1119:14.9

HOT-2 yeah right doesn't look wet its hard to tell though.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1119:56.1

CAWS "Altitude"

1120:37.5

HOT-1 nope doesn't look like they've really had any rain down here on the interstate.

1121:35.6

HOT-2 gear down before landing checklist.

1121:38.4

CAM [sound of click, similar to spoilers being armed]

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

1119:58.2

APR FedEx six thirty heavy contact tower one two eight point four two.

1120:01.8

RDO-1 one twenty eight forty two FedEx six thirty heavy we'll see ya.

1120:04.2

APR see ya.

1120:22.3

RDO-1 Memphis tower good morning FedEx six thirty heavy is on the visual for one eight right.

1121:03.5

TWR FedEx six thirty heavy Memphis tower runway one eight right cleared to land wind two seven zero at one two.

1121:08.2

RDO-1 cleared to land runway one eight right FedEx six thirty heavy.

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u>
	<u>CONTENT</u>		<u>CONTENT</u>
1121:41.6 HOT-1	alrightie spoilers are armed, autobrakes are not installed, gear is down and in.		
1121:43.4 HOT-2	checked.		
1121:52.8 HOT-1	three green.		
1121:53.6 HOT-2	checked.		
1121:54.9 HOT-1	standing by flaps.		
1122:05.9 HOT-2	tried to time it so the throttles never came up.		
1122:08.1 HOT-1	I'm sorry.		
1122:09.0 HOT-2	timing it so the throttles.		
1122:09.9 HOT-1	oh.		
1122:10.0 HOT-2	never came up so almost flaps thirty five please.		
1122:15.8 CAWS	[sound of horn] "stabilizer motion"		

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

1122:24.1
HOT-1 flaps thirty five.

1122:25.1
HOT-2 checked.

1122:25.7
HOT-1 before landing checks complete.

1122:26.8
HOT-2 this is just like the sim.

1122:28.4
HOT-1 yeah.

1122:40.2
HOT-1 that's gonna drop off a lot.

1122:41.7
HOT-2 yeah.

1122:42.1
HOT-1 gonna drop off like twenty five knots by the time we get to the ground.

1122:45.3
HOT-2 let the computer fly it for a while.

1123:01.8
CAWS "one thousand"

1123:04.5
HOT-1 stable.

1123:39.3
HOT-1 twenty knots now.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and
SOURCE

CONTENT

1123:40.6

HOT-2 yeah.

1123:45.6

CAWS "five hundred"

1123:46.7

HOT-2 cleared to land runway one eight right.

1123:48.3

HOT-2 thanks fly it from from here.

1123:55.5

CAWS [sound of tone] "autopilot"

1124:05.5

HOT-1 fifteen knots.

1124:14.8

CAWS "one hundred"

1124:17.9

CAWS "fifty"

1124:18.8

CAWS "forty"

1124:19.6

CAWS "thirty"

1124:20.5

CAWS "twenty"

1124:23.1

CAWS "ten"

AIR-GROUND COMMUNICATION

TIME and
SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

1124:27.8
CAM [sound of clunk]

1124:28.6
CAM [sound of louder clunk]

1124:29.9
CAM [sound of bang]

1124:31.2
CAM [sound of increasing banging]

1124:33.5
HOT-1 damn.

1124:34.8
HOT-2 it's not me.

1124:35.0
HOT-1 I don't know what the hell that is.

1124:35.6
CAM [sound of loud banging]

1124:42.0
HOT-2 it's not me.

1124:42.4
HOT-1 right I've I've got it.

1124:44.0
HOT-2 you got it.

1124:44.4
HOT-1 I've got it.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1124:45.5
CAWS [sound of tri-tonal alert]

1124:45.5
HOT-2 you got it.

1124:49.4
HOT-1 tell just I've got it you you talk to tower.

1124:50.6
HOT-2 you got it.

1124:51.8
HOT-? 'kay.

1124:52.1
CAWS [sound of horn] "landing gear" [repeats every three seconds until end of recording]

1124:52.2
HOT-1 tell 'em they got to close this runway.

1125:04.9
HOT-1 I am trying to stay on the runway.

1125:08.2
HOT-1 it wasn't a hard landing.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

1124:52.4
RDO-2 * six fifty eight is having some trouble.

1125:01.9
TWR FedEx six fifty eight heavy roger we are calling out the crew now.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

1125:10.4
HOT-1 at all.

1125:11.9
HOT-1 but.

1125:15.4
HOT-2 we not real sure.

1125:21.0
HOT-1 apparently a gear collapsed but uh.

1125:24.0
HOT-1 yeah.

1125:32.7
HOT-1 I'm going shut down.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

1125:12.7
TWR FedEx six fifty eight heavy can you tell me any information there.

1125:16.1
RDO-2 we are not really sure we got a good list to the airplane.

1125:22.7
TWR we have the crash crew out now sir can you give me any information before you leave the airplane.

1125:26.3
RDO-2 it looks like we have uh uh maybe a gear problem I think.

1125:33.9
TWR six fifty eight just just disregard.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

1125:42.0
HOT-1 uh hit that button, yeah hit that button.

1125:42.5
HOT-2 we we have a.

1125:46.2
HOT-2 okay.

1125:49.1
HOT-2 it's a fire.

1125:50.9
HOT-2 we got smoke coming up.

1125:52.3
HOT-1 can you can you push the.

1125:53.9
HOT-1 push the.

1125:54.6
CAM-2 yeah I got it.

1125:57.6
HOT-2 all right we gotta get out of the airplane.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

1125:35.4
TWR six thirty heavy just evacuate the aircraft as best you can see you later.

1125:38.9
RDO-2 evacuate.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

1125:57.8

HOT-1 all right.

1125:58.2

HOT-1 get.

1125:59.5

HOT-1 get that hit that hit that git this.

1125:59.7

CAM sound of whoosh.

1126:00.9

HOT-2 we gotta get.

1126:02.4

HOT-1 depressurization.

1126:03.9

HOT-2 we gotta get off the airplane now.

1126:04.1

HOT-1 thanks.

1126:04.9

HOT-1 all right yep.

1126:07.0

HOT-2 now.

1126:09.7

HOT-1 leave every-.

1126:10.3

**END OF TRANSCRIPT
END OF RECORDING**

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT