

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



GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

Cockpit Voice Recorder

DCA02MA054

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
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Washington, D.C. 20594

November 12, 2002

Cockpit Voice Recorder

Group Chairman's Factual Report by Douglass P. Brazy

A. ACCIDENT

Location: Tallahassee, FL
Date: July 26, 2002
Time: 0537 Eastern Daylight Time (EDT)
Aircraft: Boeing B727-232, N497FE
Operator: Federal Express, Flight 1478

B. GROUP

Chairman: Douglass P. Brazy
Mechanical Engineer (CVR)
National Transportation Safety Board

Member: Captain Brian J. Fox
Manager, B-727 Flight Standards and Tech Support
Federal Express Corporation

Member: Kevin F. Gallagher
Aircraft Accident Investigator
Fedex Pilots Association

Member: TR Proven
Air Safety Investigator
Federal Aviation Administration

C. SUMMARY

On July 26, 2002, at approximately 0537 EDT, a Boeing B-727-232, N497FE, operating as FedEx flight 1478, crashed into trees on short final approach to runway 9 at the Tallahassee Regional Airport (TLH), Tallahassee, Florida. The flight was operating under provisions of Title 14 Code of Federal Regulations Part 121, as a scheduled cargo flight from Memphis, Tennessee (MEM) to TLH. Night visual meteorological conditions prevailed at the time of the accident. The three flight crewmembers were injured, two seriously, and the aircraft was destroyed by impact and resulting fire.

The Cockpit Voice Recorder (CVR) contained approximately thirty-two minutes of Good¹ quality audio. The recording began at about 05:05:14 EDT during cruise flight, and ended at about 05:37:26 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 Fairchild² model A100, serial number 4549, magnetic tape CVR. The recorder was received in good condition. The exterior dust cover was sooted, but no mechanical damage was noted.

Recorder Disassembly, Tape Removal and Preparation

The recorder was disassembled using normal mechanics tools, and the tape was played back normally and without difficulty using the CVR lab's playback equipment.

¹ See Attachment I for a CVR Quality Ranking Scale.

² Fairchild is now known as L³ Communications.

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 Good³ 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.

³ See Attachment I - CVR Quality Ranking Scale

The other three channels contained audio information obtained from the Captain's, First Officer's, and Second 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 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 hot microphones were used by all three flight crewmembers throughout most if not the entire duration of the recording.

Group Activities

The CVR group convened on July 29, 2002. The group reviewed the tape and prepared a transcript of the entire recording. 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 Eastern Daylight Time (EDT)⁴. The timing of the CVR content and the correlation with the Digital Flight Data Recorder information is covered in a separate report, Cockpit Voice Recorder Timing and Correlation Study DCA02MA054.

⁴ Based on the clock used by the Federal Aviation Administration's Airport Surveillance Radar recorded data, and the correlation of that data with information from the Digital Flight Data Recorder.

Additional Information

Throughout the recording, sounds similar to breaths or breathing can be heard at various times at a comparatively loud volume on the First Officer's channel. The CVR group did not transcribe these sounds.

The surviving flight crew has been invited to review the recording and transcript at a later date. Any comments that result from the flight crew's review will be published as an addendum to this report.

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 A100 cockpit voice recorder (CVR), s/n 4549, installed on Boeing 727-232, Registration N497FE. The airplane was operated by Federal Express as Flight 1478, when it crashed short of runway 09 at the Tallahassee Regional Airport on July 26, 2002.

LEGEND

RDO	Radio transmission from accident aircraft, FedEx 1478
CAM	Cockpit area microphone voice or sound source
HOT	Hot microphone voice or sound source ¹
	For RDO, CAM, and HOT comments:
-1	Voice identified as the Captain
-2	Voice identified as the First Officer
-3	Voice identified as a Second Officer
-?	Unidentified voice or sound
GPWS	Synthesized voice from the Ground Proximity Warning System (GPWS) as heard through the Cockpit Area Microphone channel.
SZW	Radio transmission identified as the Seminole VORTAC identifier.
GVR	Radio transmission from the Gainesville Flight Service Station.
ATIS	Radio transmission from the Tallahassee Automated Terminal Information System.
RAMP	Radio transmission from the Federal Express ramp station at TLH.
CTR	Radio transmission from the Atlanta Air Route Traffic Control Center.
CTR2	Radio transmission from the Jacksonville Air Route Traffic Control Center.
UNK	unknown voice or sound source.

¹ This recording contained audio from three hot microphones. The voices or sounds heard on these channels may also be captured by the CAM channel. Normally, the source acronym used in the transcript refers to the 'best' source or the source that captured the sound most clearly.

*	Unintelligible word
@	Non-pertinent word
#	Expletive
- - -	Break in continuity or interruption in comment
()	Questionable text
[]	Editorial insertion
...	Pause

Note 1: Times are expressed in Eastern Daylight Time (EDT).

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.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

[Start of Transcript]

0505:13.9
CAM [Start of Recording]

0505:25
HOT-1 [Sound of humming/singing]

0506:08
HOT-1 right now we are about two hundred miles out uhh David.

0506:38
HOT-1 (like) Seminole on number one.

0507:09
HOT-? [sound of humming - heard on both Captain's and First Officer's channel]

0507:11
HOT-1 [sound similar to yawn]

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0506:33
SZW [sound similar to Morse code identifier for SZW VOR - heard on Captain's channel]

0509:48.0
RDO-3 Gainesville radio, FedEx fourteen seventy eight.

0510:14.9
RDO-3 Gainesville radio, FedEx fourteen seventy eight.

0510:26
GVR FedEx fourteen seventy eight, Gainesville radio.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0512:23
HOT-3

The weather is uh, winds are one two zero at five, visibility nine, uh one hundred scattered, and several other layers, temperature and dewpoint are both two two, altimeter three zero one zero.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

0510:29.5
RDO-3

Gainesville good morning, FedEx fourteen seventy eight, I was wonder'n if you had the weather for Tallahassee, sir?

0510:35
GVR

current Tallahassee reporting one hundred scattered, one eight thousand scattered, two five thousand scattered, visibility niner, wind one two zero at five, temperature and dewpoint are two two, over.

0510:50.5
RDO-3

fourteen seventy eight copies, one hundred scattered, and several other layers, winds one two zero at five, visibility nine, temperature and dewpoint two two, do you have an altimeter setting?

0511:00
GVR

three zero one zero.

0511:02.9
RDO-3

three zero one zero, 'preciate it. have a good day.

0511:06
GVR

good day sir.

0512:08
ATIS

* five five point four. Tallahassee tower will resume normal operations at six hundred local time.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0512:35 HOT-1	all right... sounds good.
0512:39 HOT-3	uh, what runway you think you gonna try for?
0512:41 HOT-1	two seven.
0512:42 HOT-3	two seven?
0512:43 HOT-1	yeah.
0512:46 HOT-1	and what'd you say the winds were again, one sixty-
0512:48 HOT-3	one-
0512:48 HOT-1	-at nine?
0512:49 HOT-3	-one two zero at five.
0512:50 HOT-1	two oh, yeah, two seven, yeah *.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0513:13 CTR	FedEx fourteen seventy eight, descend at pilot's discretion maintain flight level two four zero.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0513:21
HOT-2 twenty four.

0513:22
HOT-1 roger.

0513:30
HOT-2 got lots of moon over here.

0513:32
HOT-1 * lotsa what?

0513:34
HOT-2 lots of moon over here.

0513:35
HOT-1 yeah, I'ze gonna say, it's pretty thin that's what I was lookin' at, I don't think *.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0513:17.8
RDO-1 discretion to two four zero, FedEx fourteen seventy eight.

0513:54.9
RDO-3 Tallahassee ramp, FedEx fourteen seventy eight.

0514:02
RAMP * seventy eight.

0514:04.7
RDO-3 Tallahassee good morning, FedEx fourteen seventy eight, approximately twenty five, thirty minutes out aircraft is up, lookin' for a parkin' spot and the power.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0514:24
HOT-1 * # ice *.

0514:30
HOT-1 why don't we go ahead and open the engine anti-ice, Dave, we're pickin' up a little bit ah ice *.

0515:02
HOT-3 engine anti-ice is open.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0514:12
UNK [sound similar to background radio noise on First Officer's channel for approx 26 seconds]

0514:13
RAMP * twenty five out * gate number two * you'll be comin in on taxiway charlie * pick up the marshaller * facing south *.

0514:26.5
RDO-3 uh that's gate three, taxiway charlie and did not copy after that.

0514:37
RAMP that oughta be taxiway Charlie, gate number two.

0514:41.6
RDO-3 taxi charlie gate number two, got you [(loud 'n)/(a lot)] clear(er) now thank you.

0514:45
RAMP okay * you'll be facin uh south once you get parked there- [transmission stepped on by another radio transmission]

0514:54.8
RDO-3 copy all, FedEx fourteen seventy eight.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0515:04 HOT-1	thank you.
0515:05 HOT-3	uh, you are we are going gate two, taxiway charlie, and we're going to be facing south.
0515:12 HOT-1	all right, know where it is, thank you.
0515:14 HOT-3	CFIT [Controlled Flight Into Terrain risk assessment rating] is moderate and there is a required block time of forty four minutes.
0515:18 HOT-1	okay.
0515:27 HOT-2	one hundred scattered.
0515:29 HOT-1	yeah.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0515:32 CTR	FedEx fourteen seventy eight, contact Jacksonville center, one three four point four five.
0515:36.8 RDO-1	one twenty four forty five, so long FedEx fourteen seventy eight.
0515:40 CTR	uh, one thirty four forty five.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0516:09 HOT-1	all right speeds-
0516:10 HOT-2	nine thousand.
0516:10 HOT-1	- when you're ready.
0516:12 HOT-1	Vref one thirty seven.
0516:14 HOT-2	yah.
0516:15 HOT-1	uhhh bug at uh one forty seven.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0515:42.2 RDO-1	one thirty four forty five, good night, FedEx fourteen seventy eight.
0515:52.3 RDO-1	Jacksonville center uh good morning, FedEx fourteen seventy eight, two nine oh, discretion to two four oh.
0515:58 CTR2	FedEx fourteen seventy eight, JAX center roger, descend at pilot's discretion maintain niner thousand, Tallahassee altimeter three zero one zero.
0516:05.0 RDO-1	discretion to nine thousand, three zero one zero, FedEx fourteen seventy eight.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0516:20
HOT-1 one fifty two, one sixty two... one ninety two, two oh two.

0516:38
HOT-1 (zero fi-uh)- one thousand scattered, ten miles, uhh is zat
what it said -

0516:43
HOT-2 well we'll plan on uh-

0516:44
HOT-1 -there?

0516:46
HOT-2 -plan on a visual to runway two seven.

0516:49
HOT-1 all right.

0516:50
HOT-2 we'll back it up with this uh ILS runway two seven full pro-
cedure out to PALEE then a little teardrop...back into ah fi-
nal, on one eleven point nine, two seventy two is the final
approach course inbound.

0517:06
HOT-1 roger.

0517:09
HOT-2 ohhhh.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0517:13
HOT-2 glideslope intercept at um...looks like seventeen oh five, PALEE and we'll be at uh probably sss- eighteen hundred feet on the procedure...seventeen oh five glideslope intercept...(ahem) two hundred fifty...four on the orange bug.

0517:32
HOT-1 (roger that).

0517:37
CAM [sound similar to short interruption in recording approx 0.4 second in length - all channels]

0517:38
HOT-2 minimum safe is thirty three hundred feet all the way around... missed approach will be uh as published and we'll talk to 'em and see if we can get somethin' better.

0517:47
HOT-1 okay.

0517:48
HOT-2 published is eleven hundred, right turn to two thousand, direct uh, up to Seminole.

0517:53
HOT-1 all right, very good.

0517:54
HOT-2 runway's eight thousand...plan on rollin' out to the end gotta PAPI on the left hand side.

0518:01
HOT-1 all right *.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0518:04 HOT-2	pilot controlled lighting so if you (can)... click it seven times I'd appreciate it.
0518:09 HOT-1	definitely do that.
0518:13 HOT-1	you gonna do that?
0518:14 HOT-3	thanks.
0518:15 HOT	[sound of squeak - first officer's channel]
0518:19 CAM-2	turn the uh, ice off please.
0518:23 HOT-1	what's that?... yeah I'm sorry yeah we can close it *.
0518:30 HOT-2	all right, start on down.
0518:31 HOT-1	all right.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0518:34.2 RDO-1	uh-Atlanta Fedex uh fourteen seventy eight, leaving two nine oh for uh, nine thousand.
0518:40 CTR2	FedEx fourteen seventy eight, JAX, roger.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0518:43
HOT-3 engine anti-ice is closed.

0518:47
HOT-1 (oh), thanks.

0518:48
HOT-3 thank you.

0519:28
HOT-2 [sound of clearing of throat]

0519:38
HOT-2 you wanna land on nine if we see it?

0519:42
HOT-1 uhhhhh.

0519:46
HOT-2 we got a PAPI on nine, too.

0519:48
HOT-1 yeah, maybe dat... it just uh... be a longer taxi for us but...
way we're comin' in probly two seven be about as easy as
any of 'em.

0519:58
HOT-2 okay.

0520:21
HOT-1 [sound similar to murmuring]

0521:57
HOT-2 in range please.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0521:59 HOT-3	altimeters?
0522:01 HOT-1	set three zero one zero.
0522:02 HOT-2	set at thirty ten.
0522:04 HOT-3	set thirty ten.
0522:08 HOT-3	airspeed bugs?
0522:09 HOT-1	set.
0522:10 HOT-2	[sound similar to coughing]
0522:11 HOT-2	set.
0522:13 HOT-3	EPR bugs?
0522:15 HOT-1	G A.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0522:07 RDO	[sound similar to six microphone keyings over approx 1.3 seconds heard on Captain's and 2nd Officer's channels]

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0522:17 HOT-3	autopilot elevator servo?
0522:19 HOT-1	system A.
0522:20 HOT-3	in range checklist complete.
0522:21 HOT-1	thank you.
0522:55 HOT-2	three thousand now.
0522:56 HOT-1	(roger).

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0522:46 CTR2	FedEx fourteen seventy eight descend at pilot's discretion maintain three thousand.
0522:50.8 RDO-1	discretion to three thousand, FedEx fourteen seventy eight.
0523:33 CTR2	FedEx fourteen seventy eight, change to my frequency one three five point three two.
0523:39.0 RDO-1	one thirty five thirty two, FedEx fourteen seventy eight.
0523:49.2 RDO-1	and Atlanta FedEx fourteen seventy eight with you, one thirty five thirty two.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0524:23
HOT-1 (let's see) runway nine * runway PAPI on the left side.

0524:29
HOT-1 I don't know, you wanna try for nine?

0524:32
HOT-2 we're pointed in the right direction, I don't know, like you said (it)... kinda a long # taxiback.

0524:37
HOT-1 yeah, that'd be all right.

0524:44
HOT-2 I always thought you were supposed to land with the prevailing wind.

0524:48
HOT-2 at an uncontrolled... [sound similar to cough]

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0523:54
CTR2 FedEx fourteen seventy eight, Jacksonville roger, and ah, you got the Tallahassee weather?

0523:59.8
RDO-1 uh yes sir we do, FedEx fourteen seventy eight.

0524:03
CTR2 roger expect visual approach (into) Tallahassee, report airport in sight.

0524:06.5
RDO-1 FedEx fourteen seventy eight, roger.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0524:49
HOT-1 well at five knots it really uh ya know * * the only * the only advantage you have, landing to the west you have the glides- I mean to the west you have the glideslope... which you don't have to the east.

0525:44
CAM [sound of several clicks similar to low speed trim in motion]

0526:41
HOT-1 you familiar with the airport here... at Tallahassee?

0526:44
HOT-2 no, I'm not.

0526:45
HOT-1 see the downtown area right there straight ahead?

0526:47
HOT-2 yeah.

0526:48
HOT-1 then if you go it looks like, just about sss- south southwest there's a little group ah lights down there.

0526:53
HOT-2 ok.

0526:54
HOT-1 there's a- you can see the beacon here in just a second right in that group ah lights right-

0526:57
HOT-2 yeah I was just tryin'-

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0526:58 HOT-1	-there ya go.
0526:58 HOT-2	-to see the beacon's right in the middle of the field, right?
0527:00 HOT-1	ah yeah, um-hmm... right there.
0527:04 HOT-2	*.
0527:54 HOT-1	* PALEE is weak, * its startin to come in.
0527:58 HOT-2	not very steady either.
0527:58 HOT-1	naah.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0527:29 UNK	[sound similar to monitoring of NAVIAD audio for approximately 23 seconds, though Morse code is not clearly identifiable - Captain's Channel]
0527:39.7 RDO-3	Tallahassee FedEx fourteen seventy eight.
0527:44 RAMP	* Tallahassee OPS * * eight.
0527:46.5 RDO-3	yeah Tallahassee, fourteen seventy eight five minutes out, hey quick question, you want APU or ground power?

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0528:17
HOT-3 that'd be uh ground power when we get there.

0528:19
HOT-1 thanks.

0528:24
HOT-3 you want the approach checklist, seeing we're pretty much on our own, er?

0528:26
HOT-2 we ever decide if we're goin nine or two seven?

0528:28
HOT-1 yeah, we can do nine if you want to.

0528:30
HOT-2 okay runway nine, visual runway nine PAPI on the left hand side... approach check.

0528:35
HOT-3 briefing?

0528:36
HOT-1 complete for runway nine.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0528:03
RAMP * ground power.

0528:05.8
RDO-3 okay fourteen seventy eight copies ground power, and if you could call transportation please, thank you.

0528:12
RAMP *.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0528:39
HOT-3 altimeters?

0528:41
HOT-1 set uh, three zero one zero.

0528:43
HOT-2 set, thirty ten.

0528:45
HOT-3 minimums?

0528:47
HOT-1 uhhh its set uhh well, its uhh set at... two fifty four now for uh-

0528:52
HOT-2 two fifty four, nominal.

0528:54
HOT-1 yeah.

0528:57
HOT-3 approach checklist complete.

0529:00
HOT-1 thanks.

0529:48
HOT-1 four for three.

0529:49
HOT-2 thank you.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0529:53 CAM	[sound similar to altitude alerter]
0529:53 HOT-1	ehh you wanna call the field?
0529:55 HOT-2	yeah. I don't see the runway yet, but I got the beacon.
0529:58 HOT-1	yeah.
0530:03 HOT-3	is it pilot controlled lighting?
0530:04 HOT-1	yeah.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0529:59.6 RDO-1	Jacksonville, FedEx uh fourteen seventy eight, we have the airport.
0530:05 CTR2	FedEx fourteen seventy eight cleared visual approach into Tallahassee, are you showing the uh NOTAM Tallahassee runway uh one eight three six is closed?
0530:13.6 RDO-1	uh, no sir but uh, we're gonna use uh runway nine.
0530:17 CTR2	all right you're cleared for the visual approach, and report your down time this frequency. if unable, to Gainesville radio, change to advisory approved.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0530:39 CAM	[sound of several clicks over approx 6.5 sec period, similar to low speed trim in motion]
0530:56 HOT-2	okay, I think I got a runway now.
0530:58 HOT-1	all right.
0531:04 HOT-1	runway should be just kinda su-
0531:05 HOT-2	on the other side uh the uh-
0531:06 HOT-1	- * that beacon there-
0531:07 HOT-2	-beacon right?

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0530:24.0 RDO-1	FedEx fourteen seventy eight, good morning.
0530:32 RDO	[sound similar to five microphone keyings over approx 1.3 seconds - heard on Captain's, 1st and 2nd Officer's channels]
0530:39.1 RDO-1	Tallahassee uh FedEx fourteen seventy eight uh extended uh left base for runway nine.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0531:08
HOT-1 -yeah, right... the other side of the beacon.

0531:10
HOT-2 flaps two.

0531:11
HOT-1 flaps two.

0531:12.1
CAM [sound similar to flap handle being moved]

0531:17
CAM [sound similar to high speed electric elevator trim wheel in motion]

0531:22
HOT-2 flaps five.

0531:23
HOT-1 flaps five.

0531:24.1
CAM [sound similar to flap handle being moved]

0531:26
CAM [sound similar to high speed electric elevator trim wheel in motion]

0531:40
CAM [sound similar to high speed electric elevator trim wheel in motion]

0531:51
CAM [sound similar to altitude alerter]

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0531:59
HOT-1 * * thousand * set (for/four).

0532:34
HOT-2 well I hope I'm lookin' in the right spot here.

0532:36
HOT-1 yeah you're lookin' uh see that group of bright lights kinda to the south down there and you see the beacon in the middle of it?

0532:40
HOT-2 yeah.

0532:41
HOT-1 that's right, right over there... you're kinda on ah about ah... uh I don't know probly ten mile left base or so.

0532:47
HOT-2 okay so I was looking at the wrong # flashin-

0532:49
HOT-1 yeah.

0532:50
HOT-2 -light then.

0532:51
HOT-1 yeah.

0532:54
HOT-1 *.

0533:04
HOT-1 * see it right out there at about-

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0533:05 HOT-2	oh yeah, I was lookin' at the wrong light.
0533:07 HOT-1	* yeah okay, yeah.
0533:40 HOT-2	yeah with the direction I took, we coulda used two seven, eh?
0533:44 HOT-1	yeah, it didn't matter.
0533:48 HOT-1	yeah its about ten mile (basically) about ten miles south of the VOR.
0534:04 CAM	[sound of several clicks]
0534:11 HOT-1	I guess the lights came on, if not I'll click 'em again here... when we get * a little closer.
0534:35 HOT-1	there we go.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0533:54.6 RDO-1	uh FedEx uh fourteen seventy eight, left base uh runway nine uh Tallahassee.
0534:31 RDO	[sound similar to five microphone keyings over approx 1.5 seconds heard on Captain's, 1st and 2nd Officer's channels]

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0534:45
CAM [sound of click]

0535:18
CAM [sound similar to high speed electric elevator trim wheel in motion]

0535:24
HOT-2 flaps fifteen please.

0535:25
HOT-1 flaps fifteen.

0535:27
CAM [sound similar to high speed electric elevator trim wheel in motion]

0535:31
HOT-2 gear down, before landing check.

0535:33
HOT-3 'kay.

0535:33
CAM [sound similar to high speed electric elevator trim wheel in motion]

0535:33.6
CAM [sound similar to landing gear handle being operated, followed by sound similar to nose gear door opening]

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0535:41.8
RDO-1 FedEx fourteen seventy eight turning uh final runway nine, Tallahassee.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0535:48 CAM	[sound similar to high speed electric elevator trim wheel in motion]
0535:52 CAM	[sound of click]
0535:54 HOT-3	landing gear?
0535:56 HOT-1	down in three green.
0535:57 HOT-3	check.
0535:59 HOT-3	autobrakes?
0536:00 HOT-1	ahhh...
0536:02 CAM	[sound similar to 'flight control warning' horn]
0536:02 HOT-1	that didn't have either, uh... not installed.
0536:06 HOT-2	flaps twenty five.
0536:07 HOT-1	flaps twenty five.

AIR-GROUND COMMUNICATION

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0536:08 HOT-3	auto spoilers?
0536:09 HOT-1	not installed.
0536:10 HOT-3	FLIGHT and NAV instruments?
0536:12 HOT-1	cross checked, no flags.
0536:15 CAM	[sound similar to high speed electric elevator trim wheel in motion]
0536:20 HOT-2	ehh sorry 'bout that-
0536:20.2 GPWS	one thousand.
0536:21 HOT-2	I was line'n up on that papermill-
0536:22 HOT-1	oh that's allright nah-
0536:22 HOT-2	-or something.
0536:23 HOT-1	-that's all right no problem.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
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INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0536:25 CAM	[sound similar to high speed electric elevator trim wheel in motion]
0536:41 CAM	[sound similar to high speed electric elevator trim wheel in motion]
0536:43 HOT-1	a-and you want thirty?
0536:45 HOT-2	please.
0536:45 HOT-1	yeah all right flaps thirty.
0536:47.8 GPWS	five hundred.
0536:49 HOT-2	(I'm) gonna have to stay just a little-
0536:49 HOT-1	stable.
0536:50 HOT-2	-bit higher, (or) I'm gonna lose-
0536:51 HOT-1	yeah.
0536:51 HOT-2	-the end of the runway.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
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INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0536:52 HOT-1	yeah okay.
0536:52 HOT-3	flaps?
0536:54 HOT-1	thirty thirty, green light.
0536:56 HOT-3	landing clearance?
0536:57 HOT-1	clear to land, runway uh... number nine.
0536:58 CAM	[sound similar to high speed electric elevator trim wheel in motion]
0537:09 HOT-1	it's startin' to disappear in there a little bit, idn't it.
0537:10 CAM	[sound similar to high speed electric elevator trim wheel in motion]
0537:12 HOT-1	think we'll be alright, yeah.
0537:13 HOT-3	before landing checklist complete.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0536:59.7 RDO-1	FedEx uh fourteen seventy eight short final runway nine, Tallahassee.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0537:14.0 GPWS	one hundred.
0537:17 CAM	[sound of clunk]
0537:19.9 GPWS	fifty.
0537:20.3 GPWS	forty.
0537:20.7 CAM	[sound of crunch]
0537:21.0 GPWS	thirty.
0537:22 CAM	[sound of crunch]
0537:22 CAM	[sound of crunch]
0537:22.6 GPWS	bank angle, bank angle.
0537:23 CAM	[sound of crunching begins and continues to end of recording]
0537:25 CAM	[sound of loud squeal begins and continues to end of recording]

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
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INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0537:26.2
CAM end of recording

[End of Transcript]

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT