

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Washington, D.C. 20594

October 22, 1997

Cockpit Voice Recorder

Group Chairman's Factual Report by Vincent M. Giuliana

A. ACCIDENT

Location: Newark International Airport
Newark, NJ
Date: July 31, 1997
Time: 0131 ~~0132~~ Eastern Daylight Time (EDT)
Aircraft: Federal Express Flight 14
MD-11, N611FE
NTSB Number: DCA97MA055

B. GROUP

Chairman: Vincent M. Giuliana
Electronics Engineer/CVR
National Transportation Safety Board

Member: David Kirchgessner
Federal Aviation Administration

Member: Larry Wilkinson
FedEx Pilots Association

Member: Thomas R. Nordberg
Flight Standards MD-11
Federal Express Corporation

Member: Captain T.J. Melody
Chief Pilot
Boeing (McDonnell Douglas Corporation)

C. SUMMARY

This transcript was derived from a Fairchild Cockpit Voice Recorder (CVR) (Model A100A, S/N 25685) removed from the accident aircraft and delivered to the audio laboratory of the National Transportation Safety Board.

The playback time of the recording was approximately thirty minutes and twenty-five seconds (30:25), all of which was transcribed. All times incorporated into the transcript are in eastern daylight time, correlated with a copy of the New York TRACON audio tape provided by the Federal Aviation Administration.

D. DETAILS OF INVESTIGATION

Three channels of the CVR contained audio information from the cockpit area microphone (CAM), the captain's position and the first officer's position. The fourth channel had no useful information.

The entire external surface of the CVR was scorched and coated with soot but showed only limited impact (structural) damage. The internal crash case was also scorched and heavily discolored but showed no impact damage. Although portions of the thermal jacket's outer casing was melted and the inner material dry and crumbly, any apparent heat damage sustained by the tape was limited to several center-spooled layers that were notably brittle and crinkled.

Consistent with its apparent heat damage, fluctuations in the tape's audio amplitude were evident during the first five minutes of playback. Subsequently, however, the quality of the recording was good, enhanced by the eventual use of crewmember "hot" microphones at time 0106:08 of the transcript.

The captain was the only crewmember to accept the invitation to audition the CVR tape and review the transcript. He had no comments or suggested corrections to the transcript.

The transcript begins as Fedex flight fourteen was in contact with the Boston Air Route Traffic Control Center. According to a radio call at 0102:11, the aircraft was above flight level one eight zero.

Vincent M. Giuliani
Electronic Engineer/CVR

Transcript of a Fairchild cockpit voice recorder (Model A100A, S/N 25685) installed on a MD-11, N611FE, which was involved in an accident at the Newark International Airport, NJ on July 31, 1997.

LEGEND

CAM	Cockpit area microphone
INT	Aircraft intercom system
HOT	Crewmember "hot" microphone
RDO	Radio transmission from accident aircraft
-1	Voice (or position) identified as Captain
-2	Voice (or position) identified as First Officer
-3	Voice (or position) identified as Jump Seat Rider
-?	Unidentifiable voice
ZBW	Boston Air Route Traffic Control Center (ARTCC)
RAMP	FedEx Newark Operations
MAINT	FedEx Newark Maintenance
NYAPP	New York Terminal Radar Approach Control (TRACON)
ATIS	Newark Automatic Terminal Information Service (ATIS)
EWR	Newark Air Traffic Control Tower, Local Control

Note: Unless otherwise noted, only those radio transmissions to and from the accident aircraft were transcribed.

LEGEND (continued)

- * Unintelligible word
- # Expletive deleted
- ... Pause
- () Questionable text
- [] Editorial insertion
- Break in continuity

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.

INTRA-COCKPIT COMMUNICATION

AIR-GROUND COMMUNICATION

TIME and
SOURCE

CONTENT

TIME and
SOURCE

CONTENT

0102:03
Beginning of Recording

0102:03
Beginning of Transcript

0102:03
RDO-2 that's affirm SHAFF three after Hancock FedEx fourteen heavy.

0102:06
ZBW roger.

0102:11
ZBW okay FedEx fourteen, descend and maintain flight level one eight zero.

0102:15
CAM-1 that's affirm.

0102:17
RDO-2 down to flight level one eight zero, FedEx fourteen heavy.

0102:22
CAM-1 ah remind me to [REDACTED] se.

0102:27
CAM-2 yeah, okay.

0102:29
CAM-1 *** ... you might ask him if wants that at our discretion ***.

0102:34
CAM-? ***.

INTRA-COCKPIT COMMUNICATION**TIME and
SOURCE****CONTENT**

0103:00
CAM-2 (isn't) this the APLC when it plugs out those distances?

0103:03
CAM-1 yup.

0103:04
CAM-2 that includes the ah ... runway you have before touchdown,
right?

0103:10
CAM-1 (gimme) that again.

0103:11
CAM-2 I said that includes the ah .. that includes the runway that's
used up prior to touchdown, right?

0103:21
CAM-1 for which? beyond (beyond) the glide slope?

0103:23
CAM-2 yeah.

AIR-GROUND COMMUNICATION**TIME and
SOURCE****CONTENT**

0102:35
RDO-2 and Boston center FedEx fourteen heavy, you want us out
of ah three three zero at this time?

0102:47
ZBW ah ... yeah .. you can start a gradual descent.

0102:52
RDO-2 and fourteen heavy roger.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0103:22

yeah, that's showing you how much you got remaining. if you fly the glide slope and you're right on it you've got sixty-eight. twenty-two ah right okay which is the one we're looking at, right?

0103:33

CAM-2 yeah, twenty-two right's got (so beyond is sixty-eight sixty).

0103:35

CAM-1 sixty-eight sixty.

0103:37

so if we go medium brakes we're gonna have eight hundred. so does that mean if we go medium brakes landing on this runway we'll have eight hundred and .. eight hundred feet (in front of us) when we come to a stop?

0103:47

CAM-1 yeah, *.

0103:48

CAM-2

0103:50

CAM-1 well we can .. we'll see how it goes .. I don't know. we we can probably as a matter of fact, we can .. ** * come on off regardless.

0103:57

CAM-2 yeah, *.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENTTIME and
SOURCECONTENT

0103:59

[REDACTED] ... here so well
[REDACTED]

0104:03

CAM-2

I mean .. I mean if [REDACTED] reverser so -

0104:04

CAM-1

yeah that -

0104:05

CAM-2

****.

0104:06

CAM-1

that sounds good to me .. I'd rather play it that way. that was
my original plan then I started thinking well we gotta a little
plan here. most likely we're gonna go [REDACTED]

[REDACTED]. that's what I'd like to do .. cause we come down
here and make a left turn and then ah .. I think they park us
over here so we'll come in this Pappa Charlie and your deal
on that is to ah -

0104:32

CAM-2

(not) Pappa Charlie.

0104:34

CAM-1

(you see) Pappa - sometimes sometimes you might go in
Pappa Bravo .. depends where they park us.

0104:37

CAM-2

yeah.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0104:38 CAM-1	but ah I been .. last few number of times I've come in we park over in this section right here .. but you're supposed to stay on ah ground until you get up to Pappa -
0104:48 CAM-2	until you turn in basically.
0104:49 CAM-1	yeah Pappa Charlie but when you get over here you're supposed to contact them some point in time to make sure the gate's still the same.
0104:54 CAM-2	yeah.
0104:56 CAM-1	anyways, if you're ready, we'll go dark.
0104:58 CAM-2	yup, I'm all set.
0105:07 CAM-?	**.
0105:13 CAM-2	why would this be saying IRS ONLY navigation * **?
0105:17 CAM-1	it's just not picking up ah whatever .. I don't know .. don't ask me why .. it should be picking up plenty of VORs out here.
0105:28 CAM-2	****.

<u>TIME and SOURCE</u>	<u>CONTENT</u>
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INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0105:33
CAM [sound of several loud clicks]

0105:44
CAM-1 I believe we should be getting an in-range deal from these guys telling us what our gate assignment is but ah in the event we don't get one say-

0105:52
CAM-2 why don't I call them right now.

0105:53
CAM-1 okay, you can give them a call.

0106:06
CAM-2 okay, I'm going up on two.

0106:08
HOT-1 okay, I've got one.

TIME and
SOURCECONTENT

0106:20
RDO-2 Newark ramp FedEx fourteen heavy.

0106:25
RAMP fourteen heavy parking gate thirty-one, negative ground power.

0106:32
RDO-2 roger that thirty-one I'll start the APU. we'll probably be in around forty-five.

0106:35
ZBW FedEx .. FedEx fourteen Boston center one three four point three.

INTRA-COCKPIT COMMUNICATIONTIME and
SOURCECONTENT

0106:58
HOT-2 gate thirty-one.

0107:06
HOT-1 three one?

0107:06
HOT-2 yeah.

0107:10
HOT-1 it's over in that -

0107:11
HOT-2 yeah, right where you said we'd be.

AIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0106:37
RAMP copy that.

0106:39
RDO-1 thirty-four point three, roger.

0106:41
RDO-2 and it might be a little sooner .. we might be in around thirty-five to forty-five for FedEx fourteen heavy.

0106:45
RAMP fourteen heavy roger.

0106:50
RDO-1 ah good morning Boston .. FedEx fourteen is with you out of twenty-one five for one eight zero.

0106:56
ZBW fourteen roger.

INTRA-COCKPIT COMMUNICATION

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

TIME and SOURCE

CONTENT

0107:16
HOT-2 we're way down at the end there ... there right where you said.

0107:17
HOT-1 got it .. so we'll be going in that ah Pappa Charlie and ah somewhere along the line when we get down there you can advise the ground .. the ground control that that's where we want to go in.

0107:29
HOT-2 okay.

0107:29
HOT-1 cause a lot of times they'll be expecting us to come in that other direction there.

0107:42
HOT-1 [sound of human whistling]

central aural warning system

0107:45
ZBW FedEx fourteen verify you're going to Newark tonight.



0107:48
CAM [sound of tone and verbalized "altitude" from the CAWS]

0107:49
HOT-1 that's affirmative.

0107:50
RDO-2 FedEx fourteen that's affirmative we're going to Newark.

0107:56
HOT-2 there's coming up on eighteen thousand.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0107:56 HOT-1	boy that cuts it close, don't it.
0108:06 HOT-2	I started to reach for the hand mic.
0108:34 HOT-1	[sound of human whistling]
0108:39 HOT-1	you might ask him if he's gonna expect us to ah cross the ah SPARTA twenty-five degree at eight thousand feet ... or twenty-five miles at eight thousand feet.
0108:53 HOT-2	is this .. who is this Boston still?
0108:55 HOT-1	it's Boston, yeah.
0109:12 HOT-1	I think I'm gonna cut this radar off .. I don't think we need it.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0108:59 RDO-2	ah Boston FedEx fourteen heavy are you expecting us to cross the SPARTA at twenty-five at ah eight thousand?
0109:05 ZBW	(probably) at seven yeah .. can't do anything for another ten miles .. we do it every day .. don't worry .. I'll take care of you.
0109:09 RDO-2	roger.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0109:16 HOT-1	get all the glitter out of there ... anyways ah we're at eighteen .. we can do an in-range.
0109:24 HOT-2	roger that.
0109:47 HOT-2	(I say) for altimeter there?
0109:49 HOT-1	three zero two four huh. yeah I'm just gonna hold on the altimeter until we go below eighteen.
0109:54 HOT-2	thirty twenty-four, okay.
0110:14 HOT-1	thirty miles.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0109:15 RDO-2	yeah.
0110:15 ZBW	FedEx fourteen cross twenty-five north of SPARTA at seven thousand .. altimeter three zero two seven.
0110:21 RDO-2	roger twenty-five north of SPARTA at seven thousand three zero two seven FedEx fourteen heavy.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>CONTENT</u>
0110:29 HOT-1	okay seven is the number .. I'm gonna put ten in here for just a second so I can get it to slow .. without shooting through there ... and three zero two seven.		
0110:50 HOT-2	so won't it slow down automatically?		
0110:53 HOT-1	well I'm .. I level changed it just to get it to go down quicker.		
0110:56 HOT-2	oh, okay.		
0110:57 HOT-1	and we're behind as it is anyways.		
0111:01 HOT-2	so do you have to keep that ten in until we get to ten basically before you put seven in?		
0111:04 HOT-1	well, it's the safe way to do it.		
0111:05 HOT-2	yeah, okay.		
0111:06 HOT-1	it's just not a .. it's a technique more than anything else but ah -		
0111:11 HOT-2	any, I'm just starting to see the altimeter zero two seven on the altimeters and in-range check is complete.		

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0111:12
CAM [sound of chime similar to that of ACARS message]

0111:18
HOT-2 gate thirty-one north is what they're saying. negative ground power.

0111:36
HOT-1 so like we've got thirty-one miles to make that and we've got ah what ah four, three, seven, twenty-one we're looking good.

0111:43
HOT-2 seven'll be twenty-one, yeah we're fine.

0111:50
HOT-1 now what I could do .. when this comes back .. go back to PROF .. then I put seven in here and now it will do it automatically.

0111:59
HOT-2 and you probably pop the -

0112:00
HOT-1 it's just when you come out of ah -

0112:02
HOT-2 then you pop the drag out then too huh?

0112:05
HOT-1 when you come out of that deal there it's ah .. out of PROF you're on your own. if you put something lower than ten thousand -

TIME and
SOURCECONTENT

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0112:12
HOT-2 yeah.

0112:13
HOT-1 in there and you just level change it, it'll shoot right on by.

0112:15
HOT-2 oh it will? okay

0112:16
HOT-1 yeah.

0112:27
HOT-2 well this should be at seven thousand not eight thousand
 here.

0112:30
HOT-1 well below seven or ah -

0112:32
HOT-2 well I mean that's what he wanted us at seven right so I can
 come over here and go like this.

0112:34
HOT-1 okay yeah you can put it ah you can put it at seven if you'd
 like.

0112:41
HOT-1 you need a slash in there though, you got it?

0112:42
HOT-2 yeah I was gonna go -

TIME and
SOURCECONTENT

INTRA-COCKPIT COMMUNICATION**AIR-GROUND COMMUNICATION****TIME and
SOURCE****CONTENT**

0112:47
HOT-1 I'm just gonna help this out a little bit. let's see .. we got ah seven three -

0112:57
HOT-2 it's saying not allowed.

0113:00
HOT-1 well .. oh you're on the DIRECT TO page.

0113:02
HOT-2 oh okay.

0113:02
HOT-1 you need to go back to FLIGHT PLAN.

0113:08
HOT-2 first time I did that.

0113:13
HOT-1 just ignore the speed limit exceeded .. it's not a problem.

0113:49
HOT-1 gotta clear that BUTTON PUSH IGNORED outta there ... there you go.

0113:57
HOT-1 that's okay .. when we're around the bend here I'll just level change it and it'll .. it'll do its thing there.

0114:00
HOT-2 there it goes.

**TIME and
SOURCE****CONTENT**

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0114:01
HOT-1 it'll make it quicker.

0114:22
HOT-1 [REDACTED] back that all we're
[REDACTED] because of those brakes
[REDACTED] and all that stuff so.

0114:28
HOT-2 okay.

0114:32
HOT-1 which if you actually you can use your microphone and push
forward on your push-to-talk switch and that'll just use the
interphone back there.

0114:36
HOT-2 okay.

TIME and
SOURCECONTENT

0114:43
[REDACTED] !
yeah we should be on the ground here in about .. about
another fifteen twenty minutes .. we're gonna have a pretty
quick stop here because we're landing on a short runway
just to give you guys a heads up in the back there.

0114:54
ZBW I appreciate it.

0114:56
HOT-1 did you pull back or push forward?

0114:59
HOT-2 I pushed it forward.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0115:01
HOT-1 ah well it should be. test. it should just go to the back if you push forward on it.

0115:08
CAM [sound of tone and verbalized "altitude" from the CAWS]

0115:08
HOT-1 two one.

0115:11
HOT-2 just went like that.

0115:13
HOT-1 there you go .. that'll work.

0115:17
HOT-2 try [sound of laughter]

0115:20
HOT-1 oh well.

0115:20
INT to give you guys a heads up we're gonna be landing pretty ah pretty quick here .. we've got about another fifteen minutes to go to get on the ground .. we got a short runway so .. so let you know that the aircraft is going to be stopping pretty quick.

0115:36
HOT-2 [sound of laughter]

TIME and
SOURCECONTENT

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0115:39
HOT-1 I'm sure you're the only guy in this airline that's ever done that before.

0115:43
CAM-3 I've never done that.

0115:44
HOT-1 nah, me neither.

0115:44
CAM-3 [sound of laughter]

0115:46
HOT-2 I don't know what in the world happened .. I mean I was pushing on that thing forward.

0115:49
HOT-1 you can turn on those lights if you would.

0115:51
HOT-2 yeah sure.

0115:52
HOT-1 ah landing lights.

0115:53
CAM [sound of several clicks]

0115:56
HOT-1 and in-range is complete, correct?

0115:57
HOT-2 yes.

TIME and
SOURCECONTENT

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0115:59
HOT-1 yeah, we made that with plenty of room to spare.

0116:16
HOT-1 [REDACTED] **LANDING LIGHT**

0116:28
HOT-1 just having all kinds of fun here.

0116:29
HOT-2 [REDACTED] ?

0116:31
HOT-1 well let's see.

0116:32
HOT-2 is the left side out?

0116:33
HOT-1 think so.

0116:35
HOT-1 [REDACTED] ing.

0116:39
HOT-1 well I guess we got another thing we'll write up.

0116:45
HOT-2 should I punch that over to maintenance real quick?

0116:48
HOT-1 say again.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0116:49
HOT-2 want to ACARS 'em real quick or just let them know?

0116:52
HOT-2 I'll call Newark real quick.

0116:53
HOT-1 no, I don't think it's a big issue. they'll defer it if they have to
but -

TIME and
SOURCECONTENT

0117:07
RDO-2 Newark maintenance FedEx fourteen.

0117:15
MAINT fourteen maintenance.

0117:17
RDO-2 yeah maintenance fourteen .. just giving you a heads-up ..
[REDACTED]

0117:25
MAINT okay fourteen we'll see you at the gate.

0117:27
RDO-2 bye.

0117:29
HOT-1 [REDACTED] these
[REDACTED] some of the worst mechanics we've got
[REDACTED] they
got a note in the little orange pages down here -

0117:44
HOT-2 ah huh.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0117:45
HOT-1 that when you .. for the parking spot we're going to .. that if there's any containers on the right-hand side there by the blast fence .. you'll see this blast fence when we get up there

0117:53
HOT-2 yeah.

0117:54
HOT-1 that ah uhm that you're supposed to shut down and get towed in. ah so in theory, they're supposed to always clear those out .. and you .. there'll be a hundred of them over there .. if there's any .. if there's .. I mean it'll they'll just be all over the place .. it just depends on how ah .. how tight we are here but at least we'll have the blast fence.

0118:15
HOT-1 yeah, we're going to thirty-one you said?

0118:16
HOT-2 yes.

0118:17
HOT-1 yeah.

0118:18
HOT-2 it's right down at the end there.

0118:19
HOT-1 they can't go too far but .. I've actually just stopped it right there and told them to tow us in before.

TIME and
SOURCECONTENT

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0119:02 HOT-2	luckily the controller probably thinks that I was a ah some passenger airline flight engineer calling up the flight attendants or something.
0119:08 HOT-1	what's that?
0119:09 HOT-2	I said hopefully the center will probably thinks that I was a ah some passenger airline calling the flight att -
0119:13 HOT-1	yeah, he wouldn't figure that it's us ah -
0119:15 HOT-2	not FedEx.
0119:16 HOT-1	freight dogs.
0119:21 HOT-2	[sound of laughter]
0119:24 HOT-1	ah it barely matters.
0119:37 HOT-1	[sound of human whistling]
0119:40 HOT-2	I heard a captain once give a whole .. briefing on weather .. their route of flight and everything to the passengers over the radio one time. it was pretty funny.

<u>TIME and SOURCE</u>	<u>CONTENT</u>
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INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT0119:49
HOT-1

[sound of laughter]

0119:50
HOT-2

I was flying with Delta.

0119:51
HOT-1

probably talking for twenty minutes man.

0119:52
HOT-2

yeah ... I bet every air .. every airline in the system was calling him up and saying yeah that sounded real good yeah you know.

0120:00
HOT-1

[sound of laughter]

0120:00
HOT-2

really giving him .. really giving him #.

0120:02
HOT-1

ah.

0120:03
HOT-2

and all these other airlines, United .. and all that stuff.

0120:22
HOT-1

any time boys.

TIME and
SOURCECONTENT0120:30
RDO-1

folks don't seem to be overly busy this evening.

INTRA-COCKPIT COMMUNICATION**TIME and
SOURCE****CONTENT**

0120:36
HOT-1 yeah and they won't talk to us .. ah see .. we probably
should be talking to New York or something.

AIR-GROUND COMMUNICATION**TIME and
SOURCE****CONTENT**

0120:46
ZBW who's that calling?

0120:48
RDO-1 that was FedEx fourteen .. I was just saying that ah it
seems awfully quiet out here, we weren't sure we still had
you anymore.

0120:52
ZBW you still do .. let's go over to New York now one two zero
correction ah .. (let's get) the right frequency .. one two five
point five .. have a nice night.

0120:59
RDO-2 twenty-five five switching.

0121:40
RDO-2 New York FedEx fourteen heavy with you at seven
thousand.

0121:44
NYAPP FedEx fourteen heavy New York approach roger .. proceed
direct to Teterboro for the ILS two two right .. Newark
altimeter three zero two three.

0121:53
RDO-2 direct Teterboro .. three zero two three FedEx fourteen
heavy.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0121:58
HOT-1 I don't have that in there anywhere but if you can just -

0122:02
HOT-2 I'll put it in there .. TEB .. got it.

0122:08
HOT-1 that's at just about Agnss .. I'll just .. I'll just head direct to that pretty much for right now.

0122:14
HOT-2 there's the ah -

0122:15
HOT-1 and when you get it in there we'll .. you don't have to do that. this .. Agnss and Teterboro are just about the same spot. direct there will work.

0122:22
HOT-2 there it is.

0122:24
HOT-2 nav's available.

0122:25
HOT-1 okay, you can make it direct Agnss .. be alright .. I'm sorry. that's close enough .. it's .. they're right on top of each other.

0122:45
HOT-2 oh, okay yeah.

TIME and
SOURCECONTENT

0122:49
NYAPP FedEx fourteen heavy descend and maintain three thousand.

INTRA-COCKPIT COMMUNICATION**AIR-GROUND COMMUNICATION****TIME and
SOURCE****CONTENT****TIME and
SOURCE****CONTENT**

0122:56
CAM [sound of several clicks]

0122:57
HOT-1 three thousand .. ah .. Agnss will be alright .. direct Agnss.

0122:58
HOT-2 three thousand ... and kill Teterboro?

0123:02
HOT-1 yeah, you don't need that. it's pretty much the same spot.
okay, now (I'm in NAV).

0124:16
HOT-2 what's that ATIS Kilo ... there's one ten seventy-five ..
one ten seventy-five.

0124:28
HOT-1 [sound of human whistling]

0125:04
CAM [sound of tone and verbalized "altitude" from the CAWS
repeats twice]

0125:08
HOT-2 and four for three.

0125:09
HOT-1 alright.

0122:52
RDO-2 three thousand now FedEx fourteen heavy.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0125:10 HOT-2	why .. why does it have that amber altitude up there?
0125:12 HOT-1	say again.
0125:14 HOT-2	see that .. see that amber altitude right below the ... on your side there.
0125:16 HOT-1	ah your .. yeah I've got .. we've got a difference .. I got twenty .. thirty twenty-three .. you got thirty twenty-seven. he gave twenty-three a minute ago to somebody. we'll just verify it when we get down there.
0125:23 HOT-2	oh okay .. I'm sorry.
0125:26 HOT-1	that's what that's all about.
0125:26 HOT-2	yeah sure.
0125:34 HOT-2	(and) coming up on three thousand.
0125:34 HOT-1	I could be wrong. maybe he gave that to somebody else going someplace else .. but I heard a three zero two three in there awhile ago.

AIR-GROUND COMMUNICATION

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

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0125:38 HOT-2	yeah oh, I think you're right .. I think I forgot .. failed to set it.
0126:17 HOT-1	I'll take slats extend.
0126:20 HOT-2	slats extend.
0126:21 CAM	[sound of several clicks, similar to that of the flap/slat handle movement]
0126:21 HOT-1	and well looks like we do an approach check.
0126:25 HOT-2	(two are tuned there.)
0126:32 HOT-2	want the approach check?
0126:33 HOT-1	approach check, yes. I don't know if you heard me or not.
0126:35 HOT-2	okay, briefing?
0126:36 HOT-1	ah .. it's complete for twenty-two right.
0126:39 HOT-2	altimeters?

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0126:41
HOT-1 I've got three zero two three set on this side.

0126:43
HOT-2 three zero two three set on this side .. we'll .. we'll check again (with) the next controller there. okay minimums?

0126:49
HOT-1 ah two eleven.

0126:50
HOT-2 two eleven .. radios?

0126:54
HOT-1 look tuned and identified.

0126:55
HOT-2 tuned and identified .. approach checklist complete.

TIME and
SOURCECONTENT

0127:24
NYAPP FedEx fourteen heavy turn right heading one eight zero.

0127:26
RDO-2 one eight zero FedEx fourteen heavy.

0127:34
HOT-1 one eighty.

0127:38
ATIS Newark airport information Lima time zero four five one Zulu .. automated weather .. wind two five zero at five .. visibility one zero .. eight thousand scattered .. temperature two zero .. dew point one two ..altimeter three zero two four.

INTRA-COCKPIT COMMUNICATIONTIME and
SOURCECONTENT

0127:59
HOT-2 the ATIS is calling three zero two four.

0128:02
HOT-1 okay.

0128:02
HOT-2 a there .. he just called three zero two three though.

0128:13
HOT-1 flaps fifteen.

0128:14
HOT-2 flaps fifteen.

0128:15
CAM [sound of several clicks, similar to that of the flap/slat handle movement]

0128:50
HOT-2 there's a beacon out there.

AIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0127:59
NYAPP [continuation of transmission to another aircraft] ... Newark altimeter three zero two three.

0128:04
NYAPP FedEx fourteen heavy .. descend and maintain two thousand .. advise field in sight.

0128:08
RDO-2 two thousand .. will advise .. FedEx fourteen heavy.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0128:51
HOT-1 I sure don't see it.

0128:58
HOT-2 there's a beacon right out ... it's all white .. it's gonna go green again in a little bit.

0129:05
CAM-? it should be over here.

0129:07
HOT-1 I still don't have it.

0129:08
HOT-2 the white strobes .. see the white strobes .. I don't know if that would .. if that's the end of the runway.

0129:10
HOT-1 okay yeah .. got it .. got it .. it was sitting right here in the -

TIME and
SOURCECONTENT

0129:01
NYAPP FedEx fourteen heavy .. the field's ah one o'clock and ah eight.

0129:05
RDO-2 fourteen heavy roger.

0129:12
RDO-2 and fourteen heavy's got the field in sight.

0129:14
NYAPP FedEx fourteen heavy .. cleared visual approach runway two two right .. contact Newark tower one one eight point three .. good day.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0129:25 HOT-2	cleared the approach .. eighteen three.
0129:32 HOT-2	there it is .. got it?
0129:33 HOT-1	I got it.
0129:42 HOT-1	flaps twenty-eight.
0129:44 HOT-2	flaps twenty-eight.
0129:45 CAM	[sound of several clicks, similar to that of the flap/slat handle movement]

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0129:20 RDO-2	eighteen three FedEx fourteen heavy switching.
0129:34 RDO-2	tower FedEx fourteen heavy is rolling final runway two two right.
0129:45 EWR	FedEx fourteen heavy .. ah winds two five zero at five .. two two right cleared to land.
0129:51 RDO-2	cleared to land two two right FedEx fourteen heavy.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT

0129:55

HOT-2 flaps are at twenty-eight.

0129:55

HOT-1 got a glide slope capture .. gear down .. before landing check.

0129:58

CAM [sound similar to that of landing gear being lowered]

0130:01

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

0130:02

HOT-2 [redacted] brakes.

0130:03

HOT-1 [redacted] brakes will be fine.

0130:05

HOT-2 [redacted] they work.

0130:17

HOT-1 flaps thirty-five.

0130:19

CAM [sound of several clicks, similar to that of the flap/slat handle movement]

0130:25

HOT-2 okay, spoilers are armed .. autobrakes?

0130:30

HOT-1 okay, maximum .. looks like it's set.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0130:32 HOT-2	land .. landing gear down in four green.
0130:34 HOT-1	down in four green .. flaps fifty.
0130:36 HOT-2	flaps fifty.
0130:36 CAM	[sound of several clicks, similar to that of the flap/slat handle movement]
0130:41 HOT-2	flaps are fifty.
0130:43 HOT-1	okay.
0130:44 HOT-2	coming up on and -
0130:45 HOT-1	coming off the autopilot.
0130:48 HOT-2	flaps are fifty.
0130:48 CAM	[sound of warble tone and verbalized "autopilot" from the CAWS]
0130:49 HOT-2	before landing checklist is complete.

INTRA-COCKPIT COMMUNICATIONAIR-GROUND COMMUNICATIONTIME and
SOURCECONTENT0130:59
HOT-10131:01
HOT-2

roger that .. two and three.

0131:03
CAM

[sound of unknown click and chime]

0131:03
CAM

[verbalized "one thousand" from the CAWS]

0131:07
HOT-1

category one.

0131:09
HOT-2

(got that.)

0131:38
CAM

[verbalized "five hundred" from the CAWS]

0131:40
HOT-2

alright .. cleared to land two two right.

0132:03.00
HOT-2

there's (coming up) minimums.

0132:05.85
HOT-2

okay, gear's down .. flaps are fifty.

0132:09.58
HOT-2

brakes on max.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0132:09.65 CAM	[verbalized "one hundred" from the CAWS]
0132:13.84 CAM	[verbalized "fifty" from the CAWS]
0132:14.71 CAM	[verbalized "forty" from the CAWS]
0132:15.72 CAM	[verbalized "thirty" from the CAWS]
0132:16.55 CAM	[verbalized "twenty" from the CAWS]
0132:17.67 CAM	[verbalized "ten" from the CAWS]
0132:18.75 CAM	[sound of initial touchdown]
0132:19.21 HOT-1	#.
0132:20.26 CAM	[sound of increase in high frequency tone, similar to that of engine spool-up]
0132:21.06 CAM	[sound of decrease in high frequency tone, similar to that of engine spool-down]
0132:20.98 HOT-1	# damn it.

AIR-GROUND COMMUNICATION

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

0132:21.56
HOT-2 jesus.

0132:21.62
CAM [sound of loud thump, similar to aircraft touchdown]

0132:22.42
HOT-1 # damn it.

0132:23.14
CAM [0.31 second loss in CVR audio]

0132:23.84
HOT-1 #.

0132:24.43
HOT-1 oh #.

0132:26.05
CAM [verbalized "tire failure" repeats twice]

0132:26.43
HOT-2 # damn it (damn it.)

0132:27.42
CAM [sound of metallic break-up]

0132:28.83
CAM [end of recording]

**TIME and
SOURCE****CONTENT**