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**NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.**

**GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION
COCKPIT VOICE RECORDER
DCA03MA022**

(64 Pages)

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



GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

Cockpit Voice Recorder

DCA03MA022

by

**Douglass P. Brazy
Mechanical Engineer (CVR)**

Warning

The reader of this report is cautioned that the transcription of a CVR tape is not a precise science but is the best product possible from an NTSB group investigative effort. The transcript, or parts thereof, if taken out of context, could be misleading. The attached CVR transcript should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the transcript as the sole source of information.

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

April 17, 2003

Cockpit Voice Recorder

**Group Chairman's Factual Report
by Douglass P. Brazy**

**NTSB Accident Number
DCA03MA022**

A. ACCIDENT

Location: Charlotte-Douglas International Airport, Charlotte, NC
Date: January 8, 2003
Time: 08:48 Eastern Standard Time
Aircraft: Beech 1900, N23YV
Operator: Air Midwest , Flight 5481

B. GROUP

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

Member: Chris Herrold
Production Test Pilot
Raytheon Aircraft

Member: Captain John Farmer
Manager of Flight Standards
Air Midwest Inc

Member: Eric West
Air Safety Investigator
Federal Aviation Administration

Member: John Doxey
First Officer – Air Midwest
Air Line Pilot’s Association

C. SUMMARY

On January 8, 2003, at about 0848 Eastern Standard Time (EST), Air Midwest flight 5481 (d.b.a. US Airways Express), a Beech 1900, N233YV, crashed shortly after takeoff from Charlotte-Douglas International Airport (CLT), Charlotte, North Carolina after a distress call was made by the Captain. The flight was a scheduled passenger flight to Greenville-Spartanburg, South Carolina. The 2 crewmembers and 19 passengers onboard were killed and one person on the ground received minor injuries. The airplane was destroyed due to impact forces and a post crash fire.

The Cockpit Voice Recorder (CVR) contained approximately thirty-one minutes and forty-seven seconds of audio. The recording began at about 08:15:41 EST as the crew was preparing for the flight, and ended at about 08:47:28 EST. A transcript of the entire recording can be found in Attachment II.

D. DETAILS OF INVESTIGATION

Recorder Examination, Disassembly, Tape Removal and Preparation

The NTSB Vehicle Recorders Division received a Fairchild¹ model A100A CVR, serial number 61979. The CVR was fitted with a DC to AC power inverter, which is normally used in airplanes configured to provide DC electrical power to the CVR.

The CVR appeared to have some moderate structural damage. Some minor deformation of the dustcover and frame was found, as well as several punctures in the dustcover. The front coverplate and the Underwater Locator Beacon bracket were both

¹ Fairchild is now known as L³ Communications.

bent, but both remained attached to the CVR. The exterior of the CVR was heavily sooted, and showed evidence of significant heat exposure. Several pieces of molten metal were found on the external surfaces of the dustcover. The paint on the exterior of the dustcover was blistered in many areas, and the interior unpainted side of the dustcover was discolored. The recorder's dust cover was removed by cutting it away from the steel crash case using normal hand tools. After the dustcover was removed, soot was found on most of the interior surfaces and components. Some of the internal (unprotected and expendable) components appeared to have been partially melted. The exterior of the protective steel "crash case" which houses the tape assembly was sooted, but otherwise generally intact with little or no mechanical damage noted. The case was disassembled using normal hand tools. The internal tape spool dustcover was easily removed, and the tape and spool were found to be intact and in good condition. The plastic tape spool cover was removed with normal tools. The endless tape was then cut with a scissors, adjacent to the tape head assembly on the "oldest data" side of the head assembly. The tape and spool were removed from the recorder. The tape spool assembly and other components found inside the crash case were found undamaged, and in generally good condition. There was no obvious evidence of heat or mechanical damage to the tape or any of the other components inside the crash case. See Figures 1-5 below.



Figure 1 - Exterior View



Figure 2 -Exterior View

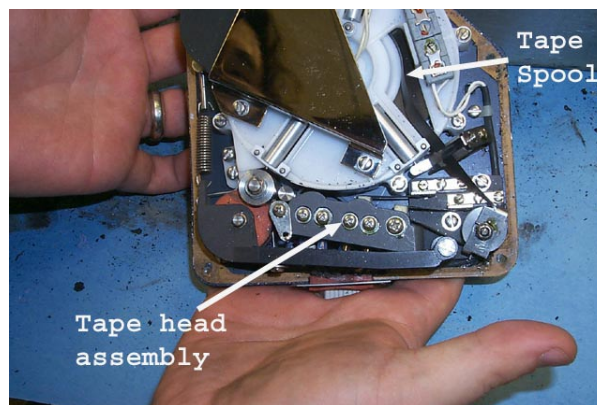


Protective Steel
"Crash Case" under this
coverplate

Figure 3 - Exterior Dustcover Removed



Figure 4 - "Crash Case" Removed



Tape head
assembly

Tape
Spool

Figure 5 - Tape Spool Assembly

A leader tape was spliced to each end of the magnetic tape. The tape was spooled to a conventional reel for use with the CVR lab's tape playback equipment. The tape was played back normally and without difficulty.

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 signal display on 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 is sometimes not present, difficult to hear, or sporadic on many recordings from CVRs that have a DC to AC inverter installed in them. However, the tone was detectable on this 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 separate channels of audio information. One channel contained the cockpit area microphone (CAM) audio information. The CAM is mounted in the cockpit, in the overhead panel between the two pilots. It is designed to capture sounds and conversations in the cockpit area whenever the CVR system is powered.

Two of the channels contained audio information from the Captain's and First Officer's audio panels, respectively. The audio panels are essentially an interface between the pilot's headsets and the airplane's communication equipment. Radio transmissions (both transmitted and received), are captured on these channels. Additionally, "hot" microphone signals (when used) are captured through the audio panels on these channels. Hot microphones are the same microphones in the pilot's headsets that can be used for making radio transmissions. The "hot" means that they are always on and being recorded by the CVR, whether or not a radio transmission is being made. On this recording, it appears that hot microphones were used by both pilots, beginning at about 08:26:26 as the crew is preparing for the flight (prior to taxiing). The hot microphones are used until the end of the recording.

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

Recording Quality²

The CAM channel and the PA channel were of Good Quality. At times, the ambient noise level of the CAM channel made it difficult to discern conversations at 'normal' speaking volume when the engines were running, but not abnormally so. This is a common issue with many turboprop airplanes.

² See Attachment I for a CVR Quality Ranking Scale.

The quality of the Captain's and First Officer's channels was Fair to Poor with respect to audio captured from the airplane's radio systems. The audio level, or volume, of the incoming radio messages was extremely low in comparison to the volume of the audio captured by the crew's hot microphones. Since the audio from the Captain's hot microphone is recorded on the same channel as the audio from the VHF radio that the Captain is monitoring, two audio signals cannot be isolated from one another when the recording is played back. The same is true for the First Officer's CVR channel. This "mixing" of these two audio signals onto the same CVR channel is normal, and not unique to this CVR system.

This low signal level (volume) for VHF radio – as recorded by the CVR – is a historical problem for the Beech (Raytheon) 1900 airplanes. In 1997, after experiencing a number of similar problems with B1900 airplanes, the NTSB issued a recommendation³ to the Federal Aviation Administration (FAA) to address the problem. Additionally, Raytheon developed a Service Bulletin (S/B 23-3094) that outlined the replacement of an amplifier in the airplane's audio system. In 2000, the FAA issued Airworthiness Directive AD 2000-20-07, which required that all applicable B1900 airplanes comply with the tasks outlined in the Raytheon Service Bulletin.

According to the airplane's maintenance records, AD 2000-20-07, S/B 23-3094 was complied with on N233YV on March 3, 2001 under work order 1010226049.

The quality of the audio from the hot microphones was Good to Excellent.

Group Activities

The CVR group convened January 10-11, 2003. The group reviewed the tape and prepared a transcript of the entire recording. No audio filters or signal processing was used during the review. Each channel was reviewed individually as well as in combination with the other channels. There was little difficulty identifying the sources of

³ NTSB Recommendation A-97-036 was Closed – Acceptable Action in January 2001

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 Standard Time (EST)⁴, and represent the time that each comment or sound begins⁵. These times are generally reported to the nearest whole second. However, the times for some comments were measured and presented in the transcript to the nearest 1/10th of a second. The correlation of the CVR with the Digital Flight Data Recorder and Air Traffic Control time data is covered in a separate report, Aircraft Performance Group Study DCA03MA022.

Douglass P. Brazy

Mechanical Engineer (CVR)

⁴ Based on the clock used by the FAA's Digital Voice Recording System at the Charlotte Air Traffic Control Tower, which records Air Traffic Control radio messages and a timecode. The timecode is generated from a Global Positioning System receiver, in Coordinated Universal Time (UTC). EST = UTC – 5 hours.

⁵ Except for outgoing radio transmissions. The time associated with these comments represents the key up of the microphone or "click" that can be heard. This is used to align the CVR timing with the DFDR, which records VHF microphone keying as one of its parameters.

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 model A100A cockpit voice recorder (CVR), s/n 61979, installed on a Beech (Raytheon) B1900D, Registration N23YV. The airplane was operated by Air Midwest as Flight 5481, when it crashed during takeoff at Charlotte-Douglas International Airport, Charlotte, NC. on January 8, 2003.

LEGEND

RDO	Radio transmission from accident aircraft, Air Midwest 5481
CAM	Cockpit area microphone voice or sound source
PA	Voice or sound heard on the public address system channel
HOT	Hot microphone voice or sound source ¹
	For RDO, CAM, HOT, and PA comments:
-1	Voice identified as the Captain
-2	Voice identified as the First Officer
-3	unidentified male voice – Ramp employee
-4	unidentified female voice – Ramp employee
-5	recorded human voice – Auto Briefer
-?	Voice unidentified
RMP1	Radio transmission from north ramp control at Charlotte
RMP2	Radio transmission from outbound ramp control at Charlotte
TWR	Radio transmission from the Air Traffic Control Tower at Charlotte
*	Unintelligible word
@	Non-Pertinent word
&	Third party personal name (see note 5 below)
#	Expletive
-, - - -	Break in continuity or interruption in comment

¹ This recording contained audio from Hot microphones used by the flightcrew. The voices or sounds on these channels were also, at times, heard by the CVR group on the CAM channel and vice versa. In these cases, comments are generally annotated as coming from the source (either HOT or CAM) from which the comment was easiest to hear and discern.

- () Questionable insertion
- [] Editorial insertion
- ... Pause

Note 1: Times are expressed in Eastern Standard Time (EST).

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.

Note 5: Personal names of 3rd parties not involved in the conversation are generally not transcribed.

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0815:41.3 CAM	[start of recording]
0816:20 CAM-?	sorry.
0816:36 CAM-2	*.
0816:54 CAM-1	release look good to you?
0816:55 CAM-2	yeah.
0816:56 CAM-1	excellent.
0816:56 CAM-1	oh * I didn't unpack my bag.
0816:58 CAM-2	uh oh... [sound of laughter].
0817:00 CAM-1	* did it again.
0817:01 CAM-2	(already, already) covered.
0817:04 CAM-2	you want me to go out there, and you -
0817:05 CAM-1	no no no, I got it.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
-------------------------------	-----------------------

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0817:05 CAM-2	-can do it.
0817:06 CAM-2	all right-.
0817:06 CAM-1	I'll just load people and do it at the same time.
0817:07 CAM-2	okay.
0817:08 CAM-1	morning.
0817:09 CAM-?	hi *.
0817:10 CAM-1	if you put your bag(s) here, I can put it up here, or you can put it underneath you seat, whatever you like I just gotta get to my bag here, so.
0817:15 CAM-?	* okay.
0817:19 CAM-1	here I'll put it up here and then we'll * it.
0817:22 CAM-?	* that little uh compartment there, good.
0817:26 CAM-1	thanks.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
-------------------------------	-----------------------

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0817:27
CAM-? (great.)

0817:29
CAM-1 yeah, we'll just put it up here right now, so I can unload all these to get to the bottom.

0817:34
CAM-1 what a mess. [sound of laughter]

0817:35
CAM-2 [sound of laughter]

0817:35
CAM-? [sound of laughter]

0818:00
CAM [unidentified sound similar to bell]

0818:09
CAM-1 come on I have new batteries in here too so-

0818:11
CAM-2 oh, score.

0818:12
CAM-? can I throw this one in here also, when you're *?

0818:13
CAM-1 yeah just set it on the ground, (I) got to grab my stuff * *
(last one on).

0818:27
CAM-2 full house back there?

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0818:29
CAM-1 that's what they told me... might be sss- one still-

0818:32
CAM-2 yeah okay.

0818:33
CAM-1 looks like there's nineteen.

0818:41
CAM-1 [sound of grunt]

0818:46
CAM-2 [sound of chuckle]

0819:08
CAM-2 how'd you sleep last night?

0819:10
CAM-1 okay.

0819:11
CAM-2 I was just like, I had one of those aviation nights. I was just like flyin all night long.

0819:16
CAM-1 really?

0819:16
CAM-2 (stuck in) I was just like.

0819:18
CAM-1 I had a dream that I was in Miami all night partying [sound of laughter].

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0819:23
CAM-1 oh, can I put that up here?

0819:25
CAM-1 thanks.

0819:30
CAM-2 in Miami huh?

0819:33
CAM-2 maybe you're destined to go to the Dash.

0819:34
CAM-2 [sound of laughter]

0819:35
CAM-1 [sound of laughter]

0819:36
CAM-1 that's what I was thinkin.

0819:36
CAM-2 [sound of laughter]

0819:50
CAM [sound similar to oxygen mask check]

0820:00
CAM-2 we full?

0820:01
CAM-1 you might want to put the fuel * * low * you know.

0820:04
CAM-1 * * (it's) twenty four, you can count it twenty two or twenty three.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0820:07
CAM-2 okay.

0820:12
CAM-? * * ramp people *

0820:12
CAM-1 oh okay.

0820:13
CAM-? * (door) *

0820:15
CAM-1 thanks.

0820:19
CAM-1 you can count nineteen people in the back, I don't know the
 bags yet.

0820:22
CAM-2 okay.

0820:23
CAM-1 I just know it's a lot of them, so.

0820:24
CAM-2 all right.

0820:25
CAM-1 * fuel whatever you *

0820:26
CAM-2 I'll put it at twenty three... I think that's good enough.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0820:28
CAM-1 good morning, welcome aboard USAirways Express service to Greenville-Spartanburg. it's... a very short flight, maybe thirty minutes gate to gate. uh we ask you to keep your seatbelts buckled till (we're at the) gate. (so) anything you brought with you needs to be stowed underneath your seat for takeoff and landing. we have two (emergency exits) on left, one on the right to open those doors... pull the handle down, turn the door sideways, throw the door out and run out... this is your uh emergency briefing card, it's in the seat in front of you we're gonna play a briefing please pay attention as we taxi out... this door can also be used as emergency exit. push the button in the box lift the handle and the door will come out. please don't hang on to that door if you do it'll pull you out... sit back relax enjoy the flight and we'll... have you there in a few minutes.

0821:19
CAM-1 *

0821:19
CAM-3 * carry on.

0821:20
CAM-2 *

0821:22
CAM-4 tire back there?

0821:22
CAM-(3) yeah.

0821:25
CAM-1 how many total bags?

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0821:27 CAM-3	uh... thirty one.
0821:29 CAM-1	thirty one and -
0821:30 CAM-3	that's-
0821:30 CAM-1	-a tire.
0821:30 CAM-3	-including carry ons.
0821:31 CAM-1	okay thank you.
0821:32 CAM-3	iszat, is that cool?
0821:33 CAM-1	we'll figure it out, yeah.
0821:35 CAM-3	plus ("the" or "uh") tire(s).
0821:37 CAM-2	thirty one bags.
0821:38 CAM-1	yeah.
0821:38 CAM-2	I saw a box back there, are they counting it as-

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
-------------------------------	-----------------------

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0821:40 CAM-1	do you have any comail? [company mail]
0821:43 CAM-4	no.
0821:43 CAM-2	or PDQ? [courier service packages]
0821:44 CAM-1	*.
0821:44 CAM-2	no PDQ. all right.
0821:45 CAM-1	it's probably a checked bag.
0821:47 CAM-2	so.
0821:47 CAM-1	hold off, on this... and add it up in your head -
0821:50 CAM-4	here you go.
0821:50 CAM-2	all right.
0821:51 CAM-1	-and then if you need the index number... to bring it in you know.
0822:00 CAM-2	(let's see) [sound of mumbling]

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
-------------------------------	-----------------------

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0822:06
CAM-2 oh on the... closet you meant?

0822:07
CAM-1 yeah that way-

0822:08
CAM-2 -yeah-

0822:09
CAM-1 -you could.

0822:09
CAM-2 gotcha.

0822:11
CAM-1 you know.

0822:11
CAM-2 yeah... adjust the index, exactly.

0822:14
CAM-2 umm, lets see * (seventy), seventy five.

0822:18
CAM-1 should be fine.

0822:19
CAM-2 yeah * (five).

0822:26
CAM-1 and if it doesn't fit then we'll move our seats forward, and put all that * [sound of laughter] behind our seats.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0822:56 CAM-2	[sound of laughter] all right... *teen, eight ten six (thir)teen and (four) is * eight eleven * *teen and three is... ten six (twenty)*... fifteen (and)
0822:58 CAM-1	*.
0822:58 CAM-2	wait a minute, is this right?
0823:02 CAM-1	where's the other part of the release?
0823:05 CAM-2	oh I got it right here-
0823:05 CAM-1	oh okay-
0823:06 CAM-2	-I'm * * (on it).
0823:06 CAM-1	-nevermind, perfect.
0823:08 CAM-2	let's see... fifteen, eighteen, eight nine ten seventeen, twenty four... * ... twenty one... * * eleven * nineteen * * * five six seven * (we're)-
0823:35 CAM-1	is it gonna work? we're close?
0823:37 CAM-2	that's without anything in the closet... let me make-.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
-------------------------------	-----------------------

INTRA-COCKPIT COMMUNICATION

TIME and
SOURCE

CONTENT

0823:39
CAM-1 seventeen... aren't-

0823:40
CAM-2 *

0823:41
CAM-1 -we seventeen one twenty?

0823:41
CAM-2 yeah... that only allows me two pounds in the closet *
(twenty)

0823:45
CAM-1 you can bring this down to twenty two-

0823:46
CAM-2 yeah, I'll (just) start over.

0823:47
CAM-1 -put ten pounds in the closet * * *.

0823:52
CAM-2 umm.

0823:52
CAM-1 here start * * that way.

0823:53
CAM-2 yeah.

0823:55
CAM-1 * * * but we're gonna be okay, right?

AIR-GROUND COMMUNICATION

TIME and
SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0823:58
CAM-2 uh yeah-

0823:59
CAM-1 okay.

0823:59
CAM-2 -I think so.

0824:00
CAM-1 finish for me, I don't wanna *

0824:00
CAM-2 * * bring it to twenty two that's fine.

0824:02
CAM-1 * * battery is on * * checked annunciator checked EFIS power's off NAV and beacons on and ground * * and * * * capped-

0824:08
CAM-2 fuel caps and prop *-

0824:08
CAM-1 -and clear over there?

0824:09
CAM-2 -capped and clear on the right.

0824:10
CAM-2 before start checks-

0824:11
CAM-3 *.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0824:11
CAM-2 -complete.

0824:12
CAM-1 what?

0824:12
CAM-3 how many we gotta take off?

0824:14
CAM-1 we're figuring it out. we don't think we have to take anything.

0824:18
CAM [sound similar to engine starting]

0824:26
CAM [sound of unidentified chime]

0824:51
CAM [sound similar to altitude alerter]

0825:36
CAM-2 *.

0825:38
HOT-1 eighty one should fit, doesn't it?...yeah.

0825:40
CAM-2 yeah.

0825:41
CAM-1 okay.

0826:17
CAM-2 *.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0826:25 CAM-1	*
0826:26 HOT-2	I'm sorry I'm operating really slow-
0826:27 HOT-1	no no no-
0826:27 HOT-2	-this morning.
0826:27 HOT-2	eight-
0826:27 HOT-1	-that's fine. I'm * I'm just it-
0826:28 HOT-2	-and three is eleven and uh-
0826:29 HOT-1	-it's I don't care, we're still on time-
0826:31 HOT-2	all righty.
0826:31 HOT-1	and take your time.
0826:32 HOT-2	all righty. eight and three is eleven... seven is uh-

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
-------------------------------	-----------------------

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0826:33 HOT-1	I didn't know we were gonna be nineteen and overloaded or I wouldn't have * let you uh I mean not let you but I * not make you do all this-
0826:37 HOT-2	[sound of chuckle] no I got ya.
0826:39 HOT-1	-I don't really care-
0826:40 HOT-2	eighteen-
0826:41 HOT-1	how fast or slow you go.
0826:43 HOT-2	-four... eight... one... zero... seven.
0826:50 HOT-2	cool... seventeen oh eighteen.
0826:55 HOT-1	seventeen one twenty is our weight huh?
0826:56 HOT-2	yeah is our max-
0826:57 HOT-1	so we're cool.
0826:58 HOT-2	-so yeah.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
-------------------------------	-----------------------

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0827:07
HOT-1 &'s lookin over there like what am I doin he knows that I *
I'm supposed to be doin the paperwork.

0827:12
HOT-2 who is that?

0827:13
HOT-1 &.

0827:14
HOT-2 oh.

0827:19
HOT-2 they show nineteen adult, uh-

0827:21
HOT-1 yeah, nineteen.

0827:22
HOT-2 oh.

0827:23
HOT-1 that's ok you're-you got it don't worry about it.

0827:24
HOT-2 one child though?

0827:26
HOT-1 but, yeah you can put eighteen and one, you can still count
them all as adult it's your liberty to do that.

0827:31
HOT-2 oh really-

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0827:31
HOT-1 yeah.

0827:31
HOT-2 -I heard other people say if it says children on there you got
to do child weights.

0827:35
HOT-1 you just gotta put the child here-

0827:36
HOT-2 yeah yeah.

0827:36
HOT-1 -you don't have to.

0827:37
HOT-2 that's what I thought, that's what I always thought, but.

0827:39
HOT-1 you know it-it's basically Captain's discretion. I mean
you're being conservative doing it that way, so I don't know
why-

0827:44
HOT-2 yeah.... *.

0827:54
HOT-1 yeah you've got Greenville/Spart-yeah you got charts up
here for Greenville/Spartanburg *.

0827:57
HOT-2 yeah.

0828:04
HOT-2 we're due out at thirty, you wanna call it...

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0828:05
HOT-1 yeah.

0828:07
HOT-2 thirty?

0828:07
HOT-1 perfect yeah.

0828:12
HOT-1 nice job.

0828:13
HOT-2 I gotta just plot this index here and then- thank you - uh
seventeen oh eighteen, and eighty one should be in here
somewhere.

0828:21
HOT-1 yeah, just put a circle there don't even put a dot. just make
sure it doesn't fall out of the... box.

0828:25
HOT-2 the box, yeah.

0828:28
HOT-2 (wait a minute), oh... oh that's right. that's in the box.

0828:34
HOT-1 [sound of chuckle]

0828:35
HOT-2 [sound of chuckle]... you wanna check it really quick?... I
think it's right.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0828:38
HOT-1 ten sixty seven... (twenty) three ten, uh thirty.

0828:55
HOT-1 that's nine... plus eight... seven, carry the one * * seven.

0829:02
HOT-1 perfect. nice job.

0829:03
HOT-2 thank you... sorry it took me so long.

0829:05
HOT-1 no, it would have taken me just as long. It just seems longer because it's awkward to you-

0829:09
HOT-2 yeah.

0829:09
HOT-1 -that I'm sitting here doing nothing.

0829:10
HOT-2 yeah that's true. good point.

0829:15
HOT-1 [sound of laughter]

0829:18
HOT-2 [sound of laughter] * is & out there?

0829:19
HOT-1 [sound of laughter] *.

0829:22
HOT-2 &'s in a funny mood today.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0829:28
HOT-1 I wonder if I've done something wrong that... is she down there yanking on the chocks?... yeah.

0829:34
HOT-2 yeah... she just pulled 'em.

0829:39
HOT-2 [sound of laughter]

0829:44
HOT-1 [sound of laughter]...&.

0829:41
HOT-2 [sound of laughter]

0829:47
HOT-2 * *. he's probably lookin at our... tail like 'bout ready to hit the ground right now, with all the bags back there... [sound of laughter]

0829:53
HOT-1 yeah.

0829:53
HOT-2 laughin at us.

0830:04
CAM/HOT [sound of click]

0830:08
CAM/HOT [sound of two clicks in rapid succession]

0830:09
CAM/HOT [sound of click]

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0830:09 CAM	[sound similar to altitude alterter]
0830:12 CAM	[sound of several clicks]
0830:18 CAM	[several clicking sounds similar to seatbelt]
0830:23 HOT-2	and the uh, after start checklist avionics master?
0830:25 HOT-1	on.
0830:26 HOT-2	engine anti-ice?
0830:26 HOT-1	on.
0830:27 HOT-2	AC buses?
0830:27 HOT-1	on.
0830:28 HOT-2	EFIS aux power?
0830:28 HOT-1	on.
0830:29 HOT-2	EFIS power?

AIR-GROUND COMMUNICATION

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

**TIME and
SOURCE**

CONTENT

0830:29
HOT-1

on.

0830:30
HOT-2

Load and volt meters are checked standby attitude indicator is on and uncaged environmental set PAX briefing... is sent. and the brakes?

0830:33
PA-5

welcome aboard. the flight crew is making final preparation for departure. as they do, please note that the Beechcraft nineteen hundred airliner has many features for your comfort and safety. as these features are presented, please follow along with a passenger information card which can be found in a seat pocket near you. the aircraft is equipped with four emergency exits, two located over the right wing and one over the left wing, which may be opened by pulling down on the red handles. also, the main cabin door through which you entered may be opened by first pressing the button, then raising the handle and pushing the door open. for those passengers seated in the over-wing emergency exit seats, please note that the passenger briefing card lists selection criteria and functions which passengers seated in these seats must be willing and able to perform in the event of an emergency evacuation. at this time please identify yourself to a flight crewmember if you are seated in an exit row and feel that you can not meet the selection criteria, or [continued next page]

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

PA-5 have a non-discernible condition that will prevent you from performing the required functions, or may suffer bodily harm from performing the required functions, or do not wish to perform these functions for any reason. your safety belt should be fastened now and should remain fastened during the entire flight. insert the flat metal end into the buckle until it clicks. pull the loose strap away from the buckle to tighten it. to release the safety belt, simply lift up on the buckle. federal aviation regulations require passenger compliance with lighted passenger information signs, posted placards and crewmember instructions concerning the use of safety belts. in addition, federal aviation regulations prohibit smoking on board at any time. in the unlikely event of a water landing, your seat cushion can be used as a flotation device. remove the cushion from the seat, pull it to your chest, and place your arms through the straps, as depicted on the passenger information card. your seatback must be in the upright position and your tray table must be stowed before each takeoff and landing. oxygen masks are located in mask containers in the wall near the ceiling or overhead if you are seated in the rear center seat. the possibility of needing additional oxygen is remote, but in case it is, the mask container doors will open. take your mask from the container and pull the cord to start the flow of oxygen. place the mask over your nose and mouth as indicated on the passenger information card. if you are traveling with a child, put your mask on first then assist the child. there are two fire extinguishers aboard. one is located in the cockpit under the right pilot seat. the other is located on the backside of the coat closet just forward of the right front passenger seat. to operate the extinguisher, pull the pin, aim at the base of any fire and squeeze the handle. the use of portable electronic devices of any kind is prohibited during takeoff and landing. the use of cellular telephones while on board is prohibited at all times. carry on baggage must be kept out of the aisle at all times and must be stowed underneath the seat in front of you during each takeoff and landing. once again, welcome aboard. we ask now that you sit back relax and enjoy the flight.[duration approximately 03:30]

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0830:36 HOT-1	released and checked.
0830:37 HOT-2	checked right-
0830:37 HOT-1	cleared over there?
0830:38 HOT-2	-after start checklist complete.
0830:38 HOT-2	clear over here.
0831:02 HOT-2	clear on the right.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0830:39.2 RDO-2	north ramp Air Midwest fifty four eighty one's ready to taxi out the sewer four charlie.
0830:45 RMP1	and fifty four eighty one, north ramp uh proceed to the north ramp hold line contacting outbound ramp one thirty one point six, be advised there is a pushback top of the concourse.
0830:54 RDO-2	to the north hold line * -
0830:56 RDO-2	talk to them and we'll look for the pushback at the top, Air Midwest fifty four eighty one.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0831:10
HOT-2 I still don't trust these center-these taxiway *-I guess... they're painted with enough room to-for our right- we got plenty of room over here.

0831:19
HOT-2 (but it) never looks like it when you're getting... ready to go.

0831:30
HOT-1 I wish we got to fly back from Raleigh to here.

0831:33
HOT-2 yeah, wouldn't that be great... clear on the right.

0831:40
HOT-2 we could uh... tell the... crew from the seven thirty seven crew that we're just gonna go ahead and fly 'em.

0831:47
HOT-1 [sound of laughter] yeah, good call.

0831:48
HOT-2 [sound of laughter]

0832:14
HOT-2 so that's what I always thought Katie that as long as you listed at the bottom like you know on the manifest that you have this many- * I always thought like... you only use child weights if you absolutely needed to and and only then the listing of how many... you know adults, children and infants you had was just in case you ever crashed or something- they're looking for bodies kinda thing.

0832:34
HOT-1 well that's what I was under the- I mean-

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0832:42 HOT-1	(you know) I think really it is whatever anybody- well-whoever is the Captain is most-
0832:46 HOT-2	yeah.
0832:46 HOT-1	-comfortable with.
0832:47 HOT-2	yeah... I think you're right.
0832:50 HOT-2	that CRJ sure is a good lookin plane isn't it?
0832:53 HOT-1	yeah, wish I was flyin it. [sound of laughter] I would love to be Captain on that because... you decide you hate the air-lines then you got that Challenger rating already.
0833:03 HOT-2	oh yeah... yeah wouldn't that be cool?
0833:06 HOT-1	yeah.
0833:13 HOT-1	we're cleared to the hold line just-
0833:14 HOT-2	cleared to the hold line-
0833:15 HOT-1	-okay.

AIR-GROUND COMMUNICATION

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0833:15
HOT-2 - I agree yeah.

0833:16
HOT-2 not to mention... you're flyin a sweet piece of equipment.

0833:21
HOT-1 yeah.

0833:22
HOT-2 yeah and then-and like flyin a Challenger would probably seem like a walk in the park after flyin that thing... you know like, it's so little. [sound of laughter]

0833:29
HOT-1 yeah... I mean I might have to, you know... you know deal with dinners in Paris or somethin, you know-

0833:37
HOT-2 yeah.

0833:38
HOT-1 -or overnights in Cancun-

0833:39
HOT-2 you might *-

0833:40
HOT-1 -you know, but.

0833:41
HOT-2 -you might suffer through it. [sound of laughter]

0833:43
HOT-1 learn another foreign language-

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0833:45
HOT-2 [sound of laughter]

0833:46
HOT-1 -but you know heck.

0833:52
HOT-2 it's just such a better lookin plane than the ERJs. after not seeing a CRJ back here for a long time I was starting to think oh, the ERJ is an ok looking plane, but they're really kinda ugly when you park a CRJ next to 'em.

0834:02
HOT-1 [sound of laughter]

0834:03
HOT-2 they are.

0834:04
HOT-1 hey they all make the paycheck *-

0834:06
HOT-2 yeah.

0834:06
HOT-1 -look nice. [sound of laughter]

0834:07
HOT-2 [sound of laughter] yeah.

0834:08
HOT-1 who is this?

0834:10
HOT-2 I don't know... looks like an Airbus three hundred maybe? I think?

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0834:14
HOT-1 well they don't have the-

0834:15
HOT-2 freighter?

0834:16
HOT-1 -winglets on it.

0834:17
HOT-2 I know but... I always thought they did too-that all Airbuses had the winglets but like the FedEx those planes they have over there, those are all three hundreds and they don't have-

0834:24
HOT-1 oh-

0834:25
HOT-2 -winglets either. I think they-

0834:25
HOT-1 -Express Net, whats that?

0834:27
HOT-2 I have no idea.

0834:28
HOT-1 that a cargo company?

0834:29
HOT-2 it's gotta be cargo they got no-

0834:29
HOT-1 it's humongous.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0834:30 HOT-2	-no uh.
0834:32 HOT-1	windows yeah-
0834:32 HOT-2	windows yeah.
0834:33 HOT-1	good call.
0834:34 HOT-1	[sound of laughter]
0834:35 HOT-2	[sound of laughter]
0834:36 HOT-2	I'm like stumblin though it-yeah I'm pretty sure that's Airbus.

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0834:39.2 RDO-2	ramp good * morning Air Midwest fifty four eighty one, north line taxi please.
0834:46 RMP2	Air Shuttle fifty four eighty er....Air Midwest fifty four eighty one proceed spot two ground one twenty one point eight please.
0834:52.9 RDO-2	spot two and we'll talk to 'em point eight, Air Midwest fifty four eighty one.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0834:59
HOT-2 there goes a CRJ right now as... as we speak... off one
eight uh, right.

0835:15
HOT-2 [sound of chuckle] I called up & cause last night when I was
walking home you know like-er walking-

0835:19
HOT-1 uh huh.

0835:20
HOT-2 -to the bus.

0835:21
HOT-2 I was like you know... & told me that m- she's givin me the
shift but it might change before... all was said and done-

0835:29
HOT-1 uh huh.

0835:29
HOT-2 -you know like I just wanna make sure that I'm not on re-
serve tomorrow, and that I'm assigned this shift and she's
like just acted I could see her on the other side of the phone
lookin at me like I had two heads. like you know like what
the heck is your problem, like hey just makin sure... she's
like no, that's right... you're... doin the shift like okay.

0835:48
HOT-1 well as far as I'm concerned if they don't get us in uh...
Greenville/Spartanburg... we're through.

0835:53
HOT-2 yeah... totally.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0835:55 HOT-2	ahhhh the uh taxi checklist. flight controls free and correct, trims are set, pressurization is set... flight instruments... two niner seven five set and cross checked.
0836:05 HOT-1	seven five. set and cross checked.
0836:07 HOT-1	we're goin to spot two, correct?
0836:08 HOT-2	yeah I agree.
0836:09 HOT-2	aux pumps?
0836:09 HOT-1	off.
0836:10 HOT-2	auto-feather?
0836:10 HOT-1	armed.
0836:10 HOT-2	ice protection?
0836:11 HOT-1	standard six.
0836:11 HOT-2	clearance radio takeoff landing data are cleared to uh Greenville/Spartanburg... HUGO five departure... radar vectors to Spartanburg.

AIR-GROUND COMMUNICATION

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

**TIME and
SOURCE**

CONTENT

0836:19
HOT-2 up to four thousand feet fifty two twenty four is a good
squawk... speeds are four four... twelve and twenty three.

0836:26
HOT-2 that's reviewed.

0836:26
HOT-1 hundred four hundred four-

0836:27
HOT-2 crew briefing.

0836:27
HOT-1 -(hundred)one twelve one twenty three. I'll take us out to
Greenville/Spartanburg standard brief-

0836:30
HOT-2 all right.

0836:30
HOT-1 for the day-

0836:31
HOT-2 *.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0836:31
HOT-1 be an engine fire prior to be- V1 the noting pilot call abort abort the flying port-pilot abort takeoff... any (other) malfunction * my attention I'll (state) abort abort or continue. Any emergen- we will continue run the appropri memr items checkl fifteen hundred feet we'll make... right traffic one eight right... if we have any problems... we're at max weight... no alternate needed into Greenville/Spartanburg. one MEL it's due, it's written up on the sixth, due on the seventeenth checklist in the box, you have any questions? [phonetic spelling used for some words to indicate how they sound as heard by the group]

0836:57
HOT-2 no questions... briefs complete, taxi checks complete.

0837:06
CAM/HOT [sound of clinking]

0837:10
HOT-2 I thought my TOLD [take off/landing data] card was headed towards TOLD card heaven.

0837:13
HOT-1 oh yeah.

0837:14
HOT-2 [sound of chuckle]

0837:14
HOT-1 what up there in the pedals?

0837:15
HOT-2 yeah underneath yeah way down in the hole.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and
SOURCE

CONTENT

0837:36
HOT-2 [sound of chuckle]

0837:47
HOT-1 uhhh. Gulfstream.

0837:50
HOT-2 you just wanna fly a jet. [sound of laughter]... I don't blame ya.

AIR-GROUND COMMUNICATION

TIME and
SOURCE

CONTENT

0837:20.0
RDO-2 Charlotte ground very good morning Air Midwest fifty four eighty one, approachin spot two with Lima.

0837:30
GND spot two Air Midwest uh, fifty four eighty one?

0837:32.7
RDO-2 yes sir.

0837:35
GND Air Midwest uh-

0837:36
GND fifty four eighty one Charlotte ground roger... standby just a moment.

0837:40.2
RDO-2 standing by.

0838:01.6
GND Air Midwest fifty four eighty one Charlotte ground taxi to runway one eight right.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0838:09
HOT-1 that guy doesn't have his fancy voice on today.

0838:14
HOT-2 see I thought it was I thought... that this was the guy with the fancy voice too and I so one morning I said like how you doing A.D.? cause * the guy with the fancy voice told me his name was A.D. or I think that's his first and last name initials.

0838:25
HOT-1 uh huh.

0838:25
HOT-2 clear on the right.

0838:26
HOT-2 anyway so so one morning I'm talking to this guy and * how you doing A.D.? he goes this isn't A.D. this is T.K.... and so I'm like oh, sorry about that. It'll never happen again he's like it's okay a lot of people confuse us.

0838:51
HOT-2 I got the ratchet down seat.

0838:53
HOT-1 oh I hate that seat.

0838:55
HOT-2 [sound of chuckle]

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0838:05.8
RDO-2 to one eight right Air Midwest fifty four eighty one good day.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0838:59
HOT-1 I still haven't had it - I've heard those-all those stories about how like... you'd be flyin along and the Captain will have the ratchet down seat and be flyin an ILS or something and all of a sudden it'd go clunk clunk clunk and it be like-

0839:08
HOT-1 ah you never had that?

0839:09
HOT-2 -stuck nu-no. [sound of laughter]

0839:10
HOT-1 # when you're in the flare (or something - you're like) #... wham.

0839:12
HOT-2 [sound of laughter] I that's what... I think I'd die laughing cause I heard like you know the Captains just start cussin up a storm (because) they're so pissed off you know like right when you you know need the seat to be like good and * solid you go like click click click [sound of chuckle] I've had it when we're taxiing around like (we'll) just be sitting here all a sudden it'll go three notches down.

0840:16
HOT-2 I think you're right I think they didn't get squat done at the... at the... negotiation session yesterday... I got no email.

0840:24
HOT-1 you didn't?

0840:25
HOT-2 nah.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0840:27
HOT-1 I... * * I don't even know if I checked my uh * .

0840:37
HOT-2 have you every seen cad-the movie Caddyshack?

0840:39
HOT-1 yeah. [sound of chuckle]

0840:40
HOT-2 have you seen it very recently at all?

0840:41
HOT-1 huh uh.

0840:42
HOT-2 I don't know if you remember or not but Rodney Dangerfield drives this like Bently or Rolls Royce or somethin that's got this really obnoxious horn that goes like (doo da da doo da) * .

0840:51
HOT-1 ah uh-huh.

0840:52
HOT-2 I can't make I can't make the sound... anyway like when every time he shows up somewhere he hits the horn and it plays this whole long thing [sound of chuckle]. and * I'se I'se lookin for... the other day I was bored * I went on the inter-net and I was lookin for um... sound files like for alert sounds you know how like if you do something wrong your computer beeps at you?

0841:10
HOT-1 yeah.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0841:11
HOT-2 instead of just like the stupid beep I was lookin for somethin a little more fun... so so I found this I don't know how I came across it but I found... a sound clip of that just that car horn going off-

0841:21
HOT-1 really.

0841:22
HOT-2 [sound of laughter] and so... and so I uh... I changed the alert for when I have incoming email on my email program to that car horn-

0841:31
HOT-1 uh oh, god.

0841:32
HOT-2 cracks (me)... I start laughing every time 'cause like you couldn't possibly miss the um email cause it plays * this long obnoxious car horn sound... it's great.

0841:42
HOT-1 I have that jungle uh... screensaver on my computer.

0841:46
HOT-2 oh cool.

0841:47
HOT-1 you know if you leave it playin after a while yuh * if you leave the sound on you'll start to hear the birds squawkin and the monkeys yellin and the-

0841:54
HOT-2 nice.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0841:55 HOT-1	[sound of laughter] it's pretty annoying when you're tryin to sleep and you're too lazy to go turn your computer off.
0841:59 HOT-2	[sound of laughter]
0842:02 HOT-1	the thing is, is I-
0842:02 HOT-2	I * know * happenin.
0842:04 HOT-2	[sound of laughter] that's awesome. I would do like the same thing it's like ahh make it go away. [sound of laughter] and I'd be like totally too lazy to get up...* do anything about it.
0842:18 HOT-2	this is peachy look at the split here. [sound of chuckle]
0842:21 HOT-1	yeah.
0842:23 HOT-2	[sound of laughter]
0842:31 HOT-1	before takeoff to the line please.
0842:31 HOT-2	before takeoff to the line flaps set and indicating seventeen, Props?

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>
0842:33 HOT-1	high.
0842:33 HOT-2	auto-ignition?
0842:34 HOT-1	armed.
0842:34 HOT-2	engine anti-ice?
0842:34 HOT-1	off.
0842:35 HOT-2	parking brake?
0842:35 HOT-1	is released.
0842:36 HOT-2	'nunciators are considered.
0842:38 HOT-2	that's before takeoff to the line.
0842:42 HOT-2	two fifty at fourteen... (a) I'il breezy... must be a front blowin through or something.
0842:56 HOT-2	I wonder what comes out of the very smallest whole in the center of the... of the... um power section there... see that there's-

AIR-GROUND COMMUNICATION

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

TIME and
SOURCE

CONTENT

0843:03
HOT-1 well *.

0843:03
HOT-2 -just like a really * you think that's all compressor air?

0843:07
HOT-1 yeah I think that uh well no no no I think it's uh the air that actually comes out of the... well I'm not sure.

0843:17
HOT-2 see which one I mean?

0843:18
HOT-1 yeah.

0843:19
HOT-2 or maybe that's not even maybe that's not even ah hole maybe that's just like... part of the assembly that all the compressor-

0843:23
HOT-1 yeah I bet it's uh-

0843:24
HOT-2 -blades turn on.

0843:25
HOT-1 it's like uh shaft or something.

0843:27
HOT-2 yeah exactly. exactly.

0843:28
HOT-1 or screwed in *.

AIR-GROUND COMMUNICATION

TIME and
SOURCE

CONTENT

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0843:29
HOT-2

yeah.

0843:29
HOT-1

because... I was gonna say maybe that's where they route the air... that has been uh... actually compressed but that's - I mean not compressed but that's actually hit the burner.

0843:39
HOT-2

oh yeah uh huh.

0843:49
HOT-2

although it might be if you ever look at like uh... Airbus or those kinda engines see they they come to a really small point at the very end... the very back end.

0843:56
HOT-1

oh yeah.

0843:59
HOT-1

but I'm not sure if that has-actually does anything.

0844:02
HOT-2

yeah, I'm not either... I be I'd be kinda interested to... go through the systems in the CRJ that'd be sweet.

0844:10
HOT-1

thirty... how bout thirty fifty and uh... twenty two... when you call the times.

0844:17
HOT-2

sounds good... oh my clock's still set back from last night.
[sound of laughter]

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0844:49
HOT-2 gosh that sure is a nice looking plane... awe. it's killin me to see those pla-those CRJs back here now. it's probably I should I should shutup you're I'm I'm doing to you right now what you were doing to me with the Krispy Kremes yesterday.

0845:01
HOT-1 [sound of laughter]

0845:02
HOT-2 [sound of laughter]

0845:05
HOT-1 at least I got & to eat one.

0845:07
HOT-2 [sound of laughter] didja? nice.

0845:10
HOT-2 & was probably lookin for any excuse he could find to eat one.

0845:18
HOT-1 sometimes I secretly go get them at the grocery store.

0845:21
HOT-2 oh yeah? yeah. I've been known to do that from time to time.

0845:25
HOT-2 awe.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0845:25.5
TWR Air Midwest fifty four eighty one, runway one eight right, taxi into position and hold.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0845:33
HOT-2 uh... below the line, transponder's ALT mode and bleeds are set. and exterior lights?

0845:37
HOT-1 are set.

0845:38
HOT-2 before takeoff checklist is complete... clear on the right.

0845:43
HOT-1 *.

0845:44
HOT-2 position and hold.

0845:45
HOT-1 clear on the left... this guy's * goin away.

0845:46
HOT-2 uhh they're gonna blast us... with his... jet blast.

0845:50
HOT-1 I love those Krispy Kreme doughnuts with the uh... the icing filling on the inside.

0845:55
HOT-2 awe... you know * I was just sayin * I started to say awe right before he told us to taxi in position and hold-you need to get a box of those and wrap them up in wedding gift wrap paper and take them to &'s wedding [sound of laughter]

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0845:28.9
RDO-2 position and hold runway one eight right Air Midwest fifty four eighty one.

INTRA-COCKPIT COMMUNICATION

TIME and SOURCE

CONTENT

0846:05
HOT-1 [sound of laughter] that's a good call.

0846:06
HOT-2 [sound of laughter]

0846:07
HOT-1 I'm gonna do that.

0846:08
HOT-2 like a huge box... you know like the size box last * that was in the crew room yesterday.

0846:13
HOT-1 that is awesome idea.

0846:14
HOT-2 [sound of laughter]

0846:16
HOT-2 wouldn't that be great?

0846:17
HOT-1 yeah.

0846:26
HOT-2 two thirty, cleared to go.

AIR-GROUND COMMUNICATION

TIME and SOURCE

CONTENT

0846:18.2
TWR Air Midwest fifty four eighty... one turn right heading two three zero, cleared for takeoff.

0846:22.0
RDO-2 two three zero cleared for takeoff *Air Midwest fifty four eighty one.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0846:28
CAM [sound similar to engine power increasing]

0846:35
HOT-1 set takeoff power please.

0846:35
HOT-2 power is set.

0846:40
HOT-2 * * * push.

0846:43.9
HOT-2 eighty knots, cross checked.

0846:49.6
HOT-2 V-one V-R.

0846:52.8
HOT-2 V-two.

0846:55.2
HOT-2 positive rate.

0846:55.8
HOT-1 gear up.

0846:58.5
CAM [sound similar to landing gear hydraulic motor operating begins]

0847:02.1
HOT-2 wuh.

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT

INTRA-COCKPIT COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0847:02.2 CAM	[sound similar to landing gear hydraulic motor operating ends]
0847:02.2 HOT-1	oh.
0847:03 HOT-1	help me.
0847:03 HOT-2	* * .
0847:03.5 CAM	[sound of click]
0847:04 HOT-1	you got it?
0847:05 HOT-2	oh #.
0847:05 HOT-1	[sound of grunt/exhale]
0847:05 HOT-2	push down.
0847:06 HOT-2	[sound of breath]
0847:07 HOT-2	oh #.

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>
0847:08 CAM/HOT	[sound similar to single landing gear warning horn - duration approximately 0.4 sec.]
0847:08 HOT-2	[sound of grunt/exhale]
0847:09 HOT-1	[sound of grunt/exhale]
0847:09 CAM	[sounds similar to change in engine/propeller noise].
0847:09 HOT-1	[sound of grunt/exhale]
0847:10 HOT-1	you uh.
0847:10.8 CAM	[sound similar to stall warning horn begins]
0847:11 HOT-1	[sound of grunt/exhale]
0847:12 HOT-1	[sound of grunt/exhale]
0847:11.8 HOT-1	push the nose down. [loud voice]
0847:13 HOT-2	[sound of grunt/exhale - loud voice]
0847:13 HOT-1	ahh. [loud voice]

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>
0847:14 HOT-1	oh my god.
0847:16 HOT-1	[sound of grunt/exhale]
0847:16.6 CAM	[sound similar to stall warning horn ends]
0847:18 CAM/HOT	(daddy) [unidentified voice other than crewmember - at a reduced volume]
0847:18.2 CAM/HOT	[sound of several clicks or clunks]
0847:20.4 CAM/HOT	[sound similar to landing gear warning horn begins]
0847:20.6 CAM	[sound similar to decrease in engine/propeller noise]
0847:20.7 HOT-1	pull the power back.
0847:21.7 CAM/HOT	[sound similar to stall warning horn begins and continues to end of recording]
0847:23.6 CAM	[sound similar to landing gear warning horn ends]

AIR-GROUND COMMUNICATION

<u>TIME and SOURCE</u>	<u>CONTENT</u>
0847:16.4 RDO-1	we have an emergency for Air-mwest fifty four eighty one.

INTRA-COCKPIT COMMUNICATION

**TIME and
SOURCE**

CONTENT

0847:24
CAM [sound similar to increase in engine/propeller noise]

0847:26
HOT-1 oh my god ahh.

0847:26
HOT-2 (uh uh god ahh #)

0847:26.3
CAM [sound similar to landing gear warning horn begins and continues to end of recording]

0847:28.1
CAM [end of recording]

AIR-GROUND COMMUNICATION

**TIME and
SOURCE**

CONTENT