

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



**GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION**

**CEN13LA462**

**By  
Bill Tuccio, Ph.D.**

**WARNING**

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

**NATIONAL TRANSPORTATION SAFETY BOARD**  
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June 30, 2014

## **Cockpit Voice Recorder - 12**

### **Group Chairman's Factual Report By Bill Tuccio, Ph.D.**

#### **A. EVENT**

Location: Eden Prairie, Minnesota  
Date: August 5, 2013  
Aircraft: Embraer S.A. EMB-505, N327FL  
Operator: Flight Options, Flight 327  
NTSB Number: CEN13LA462

#### **B. GROUP**

A group was convened on September 10, 2013.

Chairman: Dr. Bill Tuccio  
Aerospace Engineer  
National Transportation Safety Board

Member: Tom Latson  
Air Safety Investigator  
National Transportation Safety Board

Member: Kevin Morris  
Aviation Safety Inspector  
Federal Aviation Administration

Member: Dan Ramirez  
Air Safety Specialist  
Embraer Aircraft Holding, Inc.

Member: Captain Todd Anguish  
Flight Safety Manager  
Flight Options, LLC

Member: Captain Mike Minellono  
Organizing Coordinator  
International Brotherhood of Teamsters Local Union 1108

## **C. SUMMARY**

On August 5, 2013, at 0848 central daylight time, N327FL, an Embraer S.A. EMB-505, a multi-engine turbofan airplane, was substantially damaged during landing at Flying Cloud Airport (FCM), Eden Prairie, Minnesota. The two pilots were not injured. The airplane was registered to and operated by Flight Options, LLC, Cleveland, Ohio. Day visual meteorological conditions (VMC) prevailed at the time of the accident and an instrument flight rules flight plan had been filed for the 14 *Code of Federal Regulations Part 91* positioning flight. The airplane had departed Pittsburgh International Airport (PIT), Pittsburgh, Pennsylvania, about 0730 eastern daylight time and was destined for FCM. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout. The CVR group meeting convened on September 10, 2013 and a partial transcript was prepared for the last 32 minutes of the flight (see attached); the remaining 1 hour and 32 minutes of the 2-hour, 4-minute digital recording was summarized by the group.

## **D. DETAILS OF INVESTIGATION**

The NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **L-3/Fairchild FA2100-3083**  
Recorder Serial Number: **000611099**

### **Recorder Description**

Per federal regulation 14 CFR 91.609(e), multiengine, turbine engine powered aircraft with a seating capacity of six passengers or more, requiring two pilots and operating under 14 CFR Part 91, must be equipped with a CVR that records a minimum of the last 2 hours of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 2 hours of CVR operation. This model CVR, the L-3/Fairchild FA2100-3083, is a solid-state CVR that records 2 hours of digital cockpit audio. Specifically, it contains a 4-channel recording of the last 2 hours of operation. The recording contains 4 channels of audio data; one channel for each flight crew, one channel for the CAM audio information, and a fourth channel for the public address or third crewmember.

### **Recorder Damage**

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

### **Audio Recording Description**

The 2-hour and 4-minute recording consisted of three channels of useable audio information. Each channel's audio quality\* is indicated in Table 1. Notably, channel number four did not contain any audio information (nor was it required by Federal regulations).

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\* See attached CVR Quality Rating Scale.

**Table 1: Audio Quality**

<b>Channel Number</b>	<b>Content/Source</b>	<b>Quality</b>
<b>1</b>	Pilot-in-Command (PIC)	Excellent
<b>2</b>	Second-in-Command (SIC)	Excellent
<b>3</b>	CAM	Excellent
<b>4</b>	N/A	N/A

### **Timing and Correlation**

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, radio transmissions that the aircraft made at 6839.6, 6850.8, 6857.7, 6881.5, and 6890.3 CVR Elapsed Time were correlated to the radio transmit microphone key parameter from the FDR for the same radio transmissions at 386965.992, 386976.992, 386983.992, 387007.992, and 387016.992 FDR subframe reference number (SRN). Each of the radio transmissions acted as an anchor point for a linear interpolation between the CVR and FDR events. This interpolation resulted in the following relationship: 6953.218 CVR Elapsed Time = 387079.400 FDR SRN.

Once a correlation between the two recorders was established, a reference to local time was determined based on FDR recorded GPS time of: FDR SRN 387079.400 = 1346:11.000 UTC. Subtracting 5 hours to convert from UTC to CDT, resulted in the following relationship: CVR CDT = CVR Elapsed Time + 0650:17.782.

### **Description of Audio Events**

The recording began at 0650:18 CDT as Flight Options 327 was in an enroute climb. At 0650:40 CDT, a tone similar to the altitude alert was recorded, followed by the SIC calling out, 42,000 feet for 43,000 feet. After this statement, for about the next 26 minutes, the SIC engaged in radio communications; however, no intracockpit communications were recorded.

At about 0709 CDT, the SIC acknowledged an air traffic control (ATC) clearance for the AGUDE 4 arrival into the Minneapolis-Saint Paul area.

At about 0718 CDT, the PIC was faintly recorded on the CAM and began a conversation with the SIC, who was recorded on the intercom system. The PIC indicated he had lost wi-fi connectivity and was troubleshooting the issue. The SIC then informed the PIC that ATC had changed the arrival routing and discussed the FMS setup that the SIC had programmed. During approximately the next 13 minutes, no intracockpit communications were recorded.

At about 0721 CDT, ATC was recorded on the CVR trying to reach Flight Options 327, but no response from Flight Options 327 was received for about the next 8 minutes. During this 8-minute period, ATC had two other aircraft attempt an air-to-air relay that were recorded on the CVR; however, Flight Options 327 did not respond. During this time period, no flight crew intracockpit communications, radio transmissions from the aircraft, or sounds of activity in the cockpit were recorded. During this same period, rhythmic breathing was recorded on SIC hot microphone.

At 0729:25 CDT, the SIC made a radio call to the ATC center controller and asked if he had missed any ATC calls. ATC replied that Flight Options 327 had missed radio

calls for about 10 minutes. ATC then assigned a frequency change for Flight Options 327 to Chicago Center.

At about 0733 CDT, the PIC was faintly recorded on the CAM and began a conversation with the SIC, asking if the SIC was ready to have breakfast. The SIC then concluded the conversation by verifying the PIC had control of the aircraft. Sounds of rustling, similar to manipulation of the headset boom microphone, were then recorded. The PIC, recorded on the intercom, recalled issues he had with his wi-fi and how the issue was resolved. The SIC was faintly recorded on the CAM responding to the PIC.

For about the next 40 minutes, from 0735 CDT to 0815 CDT, the PIC engaged in radio communications; however, no intracockpit communications were recorded.

At about 0800 CDT, ATC cleared Flight Options 327 for a pilot discretion descent to flight level 360. The PIC acknowledged the ATC clearance.

At about 0809 CDT, the ATIS for the Saint Paul Downtown airport began on the SIC's intercom channel, and then began shortly thereafter on the PIC's intercom channel. The ATIS continued on the PIC's channel for about 42 seconds, and continued on the SIC's channel for about 7 minutes, terminating at the start of the attached partial transcript.

At about 0812 CDT, ATC cleared Flight Options 327 direct to the AGUDE intersection with a descent to flight level 240. The captain acknowledged the ATC clearance.

The remainder of the flight is covered by the attached transcript starting at 0816:22 CDT continuing until 0848:24 CDT, when power was removed from the CVR.

Power was restored to the CVR for the last 6 minutes of the recording. The voices recorded were consistent with those of the FAA and maintenance personnel onboard the aircraft.

As part of the Safety Board's accident investigation process, the flight crew was invited to review the CVR transcript and suggest corrections or additions. The PIC declined the invitation. The SIC reviewed the CVR audio and transcript on December 11, 2013 and offered no corrections or additions.

## CVR Quality Rating Scale

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

<b>Excellent Quality</b>	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.
<b>Good Quality</b>	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.
<b>Fair Quality</b>	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.
<b>Poor Quality</b>	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.
<b>Unusable</b>	Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.

**Transcript of a L-3/Fairchild FA2100-3083 solid-state cockpit voice recorder, serial number 000611099, installed on an Flight Options Embraer EMB-505 (N327FL), which crashed during landing at Flying Cloud Airport in Eden Prairie, Minnesota.**

## **LEGEND**

<b>CAM</b>	Cockpit area microphone voice or sound source
<b>HOT</b>	Flight crew audio panel voice or sound source
<b>RDO</b>	Radio transmissions from N327FL
<b>CTR</b>	Radio transmission from Minneapolis center controller
<b>APR</b>	Radio transmission from the Minneapolis approach controller
<b>TWR</b>	Radio transmission from the Flying Cloud airport tower controller
<b>FBO</b>	Radio transmission from the fixed based operator
<b>AC-7BA</b>	Radio transmission from aircraft call sign ending in 7BA
<b>ATIS</b>	Automatic Terminal Information Service
<b>AWU</b>	Aural Warning Unit
<b>-1</b>	Voice identified as the PIC
<b>-2</b>	Voice identified as the SIC
<b>-?</b>	Voice unidentified
<b>*</b>	Unintelligible word
<b>#</b>	Expletive
<b>@</b>	Non-pertinent word
<b>( )</b>	Questionable insertion
<b>[ ]</b>	Editorial insertion

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

Note 2: Generally, only radio transmissions to and from the accident aircraft were transcribed.

Note 3: Words shown with excess vowels, letters, or drawn out syllables are a phonetic representation of the words as spoken.

Note 4: A non-pertinent word, where noted, refers to a word not directly related to the operation, control or condition of the aircraft.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

06:50:17.8 CDT  
**START OF RECORDING**

08:16:22.6 CDT  
**START OF TRANSCRIPT**

08:16:23.6  
**HOT-2** [the Saint Paul Downtown ATIS terminates] alright I'm  
baacckk.

08:16:26.1  
**HOT-1** yeeahhhh.

08:16:29.8  
**HOT-1** AGUDE at eight.

08:16:33.4  
**HOT-2** AGUDE at eight. yep.

08:16:40.3  
**HOT-2** ahhh [sigh].

08:16:51.5  
**HOT-1** there we go she captured.

08:17:05.6  
**HOT-1** and descent checklist has been completed.

08:17:07.8  
**HOT-2** okay.

08:17:19.1  
**HOT-1** ahhh [sigh].



**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:17:20.0

**HOT-2** so they're usin' the ILS to one four huh?

08:17:22.6

**HOT-1** yeah.

08:17:23.7

**HOT-1** I guess I can throw that in there.

08:17:23.9

**HOT-2** you--.

08:17:25.2

**HOT-2** I was gonna say did you put it in [chuckle].

08:17:26.7

**HOT-1** nope.

08:17:32.6

**HOT-1** what.

08:17:33.3

**HOT-2** what ATIS did you get?

08:17:35.0

**HOT-1** well # maybe I got the wrong ATIS.

08:17:37.2

**HOT-2** I think you did 'cause I didn't see no one four over here  
[laughter].

08:17:39.1

**HOT-1** [laughter].

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:17:41.1

**HOT-1** I guess I didn't pay attention to the uh. I was wondering why it was so strong.

08:17:43.9

**HOT-2** (ah).

08:18:04.2

**HOT-1** yeah there's no one four.

08:18:06.8

**HOT-2** I think you need ten right.

08:18:14.9

**HOT-1** you remember where it is on the field? I was gonna look it up.

08:18:18.6

**HOT-2** it's not on there. it's up here somewhere.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:17:45.9

**ATIS** one two five three zulu wind one four zero at four visibility one zero. ceiling niner hundred overcast. temperature one seven dewpoint one six altimeter two niner niner three. ILS runway one four approach in use. the base of the Minneapolis Bravo airspace over Saint Paul is two thousand three hundred. hazardous weather information for Minnesota available on HIWAS flight watch flight service frequencies advise on initial contact you have Juliet. St. Paul information Juliet... [ATIS continues on HOT-2 for about one additional minute].

08:17:52.5

**CTR-MIN** attention all aircraft hazardous weather information convective SIGMET five eight central for Wisconsin and Iowa available HIWAS flight watch flight service frequencies.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:18:23.3  
**HOT-2** [laughter] \*\* airport is comin' in. it's not in there.

08:18:28.2  
**HOT-1** oh it's not on the ForeFlight?

08:18:30.3  
**HOT-2** uh-uh.

08:18:31.7  
**HOT-1** yeah. that sucks.

08:18:43.2  
**HOT-1** ah when you call 'em just ask 'em where they are on the field.

08:18:52.4  
**HOT-2** that is Saint Paul.

08:18:56.7  
**HOT-1** is it? it's uh the wrong ATIS?

08:19:00.7  
**HOT-1** ooh I know why. cause I I did the arrival and the arrival is probably for ah--

08:19:01.0  
**ATIS** [ATIS ends on HOT-2]

08:19:04.7  
**HOT-2** aww you didn't use what I had set in there did ya? [laughter]

08:19:05.5  
**HOT-1** \* twenty four nine.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:19:08.4

**HOT-1** yeah I did use what you had set in there.

08:19:10.0

**HOT-2** I \* wrong \* [laughter].

08:19:10.9

**HOT-1** you were wrong.

08:19:12.4

**HOT-?** sorry.

08:19:12.6

**HOT-1** well it was it's what's on the arrival so I [stammer] I figured that would be correct but. yeah.

08:19:17.5

**HOT-2** yeah.

08:20:13.1

**HOT-2** I'm off.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:19:19.2

**ATIS**

Flying Cloud Tower information Victor special observation one three zero eight Zulu wind calm. visibility two and one half light rain. mist. few clouds at four hundred. ceiling six thousand overcast. temperature one seven dewpoint one seven. altimeter two niner niner one. ILS runway one zero right approach in use. landing runway one zero right and one zero left. advise on initial contact you have Victor. [repeats]

08:20:07.0

**CTR-MIN**

[transmission to other aircraft]

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:20:14.6  
**HOT-1**   alright.

08:21:08.8  
**HOT-2**   alright I'm back.

08:21:14.7  
**HOT-2**   it's information Victor over there. winds are calm it's a special.  
a few at four hundred. six thousand overcast. two and half  
miles light rain mist. ninety one on the altimeter. ILS ten zero  
right...other than that we're lost.

08:21:39.1  
**HOT-1**   boom.

08:21:55.2  
**HOT-1**   [yawning] awww doggy.

08:21:57.9  
**HOT-2**   I heard that.

08:22:00.5  
**HOT-2**   it's gonna be a long ride to Scottsdale.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:20:16.4  
**ATIS**   [ATIS continues] ... altimeter two niner niner one. ILS runway  
one zero right approach in use. landing runway one zero right  
and one zero left. advise on initial contact you have Victor.  
[repeats]

08:21:01.3  
**ATIS**   [ATIS ends]

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:22:03.2

**HOT-1** yes it will.

08:22:05.7

**HOT-1** yeah I tried to Skype with the wife and uh @@@...[laughter]

08:22:13.3

**HOT-2** [laughter] that sounds familiar.

08:22:16.3

**HOT-1** or ah it isn't strong enough to Skype with.

08:22:21.0

**HOT-1** and it's probably her. I-I asked her to sign in. she didn't. I don't know.

08:22:28.0

**HOT-1** it doesn't seem weird cause usually if you can email you can you know Skype will work at least to talk you know. video might not work but.

08:22:35.1

**HOT-2** yeah.

08:22:56.3

**HOT-2** ahhh I guess you're ready for this in range.

08:22:59.3

**HOT-1** yeah go ahead.

08:23:00.1

**HOT-2** signs outlet switch.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:23:03.4

**HOT-1** off on.

08:23:05.0

**HOT-2** altimeters.

08:23:06.2

**HOT-1** cross checked.

08:23:07.4

**HOT-2** fuel.

08:23:08.3

**HOT-1** check.

08:23:09.2

**HOT-2** landing distance.

08:23:10.5

**HOT-1** checked.

08:23:11.6

**HOT-2** lights.

08:23:13.8

**HOT-1** taxi.

08:23:14.6

**CAM** [sound of click]

08:23:15.7

**HOT-2** loose items.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:23:17.1

**HOT-1** secured.

08:23:18.3

**HOT-2** approach brief.

08:23:20.3

**HOT-1** uhm.

08:23:22.3

**HOT-1** uh did you say six hundred? what was the low ceiling?

08:23:26.6

**HOT-1** or six thousand.

08:23:27.2

**HOT-2** six thousand over. (you don't have)--.

08:23:28.2

**HOT-1** six thousand so I don't have to brief it.

08:23:29.8

**HOT-2** two and a half miles.

08:23:30.5

**HOT-1** it'll be a visual backed up by the ILS.

08:23:33.6

**HOT-2** alright.

08:23:34.7

**HOT-1** and we'll find Elliott somehow.



**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:23:37.1

**HOT-2** ho ho.

08:23:38.9

**HOT-2** I'll talk to 'em in a minute we're still a little ways out.

08:23:55.6

**HOT-2** there on the east side of the ramp. I know that. on the airport.

08:24:04.8

**HOT-1** I've not been to Minneapolis in this airplane.

08:24:07.7

**HOT-2** I haven't been to this airport in a long time.

08:24:08.8

**HOT-1** four years man.

08:24:11.0

**HOT-1** that's wild.

08:25:03.8

**HOT-1** ya ya binga.

08:25:05.6

**HOT-2** we're about five minutes early. that's good.

08:25:08.6

**CTR-MIN**

and Options three twenty seven ah below ten thousand there  
ah will you be stayin' at two fifty?

08:25:15.8

**HOT-1** go faster if she wants.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:25:35.6  
**HOT-2** they're \* ask \* ay.

08:25:38.6  
**HOT-2** oh. I looked at that table on the on the left side over there.  
looked down the hole. there's silverware. traaaash. [laughter]

08:25:47.5  
**HOT-2** \* silverware just fell in the hole.

08:25:49.2  
**HOT-1** oh yeah they # shtick # in there and then it's hard to find.

08:25:52.3  
**HOT-2** you can't get it out.

08:25:54.1  
**HOT-1** oh you can't even get it out. nice.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:25:17.6  
**RDO-2** unless you want us to go faster.

08:25:20.2  
**CTR-MIN** I just wanted to know if you were gonn'a go slower.

08:25:23.0  
**RDO-2** no two fifty.

08:25:24.1  
**CTR-MIN** okay. thanks.

08:25:28.5  
**RDO-1** I usually forget and end up doin' three twenty.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:25:55.4

**HOT-2** no.

08:26:00.6

**HOT-2** I was wonderin' why the table was havin a little trouble goin'  
down sometimes. stickin'.

08:26:05.8

**HOT-1** @@@.

08:26:09.4

**HOT-2** (they're gonna look you know).

08:26:11.3

**HOT-2** they got money it don't matter.

08:26:12.9

**HOT-1** I don't know.

08:26:13.9

**HOT-1** @@@

08:26:21.2

**HOT-2** right.

08:26:22.1

**HOT-1** \*\* I'm findin' out that has...you know intelligence doesn't have a  
whole lot to actually the dumber you are the more [laughter]  
you just have to throw something out there and enough people  
show up to help ya'. you know it's like really weird.

08:26:37.7

**HOT-2** yeah.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:26:38.2

**HOT-1** as long as you're out there startin' a business somebody's gonna try you have to be a...basically you just have to quit. if you don't quit. you're gonna make money.

08:26:43.5

**HOT-2** yah.

08:26:53.2

**HOT-1** it almost seems like tenacity is is ah...you know...more important than intelligence.

08:27:11.6

**HOT-2** it's a mess.

08:27:22.6

**HOT-1** I miss being self-employed.

08:27:25.4

**HOT-2** yeah.

08:27:26.1

**HOT-1** I'm a still contemplating it. we'll see.

08:27:29.4

**HOT-1** (gotta).

08:27:33.1

**HOT-1** gotta put up with the wife figuring out what she wants to do. but man I'd love her to want to start a business.

08:27:43.5

**HOT-2** @@@

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:27:44.7  
**HOT-1** @@@

08:27:45.3  
**HOT-2** ahhh.

08:28:23.3  
**HOT-2** alright you heard the young man.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:27:47.6  
**CTR-MIN** Options three twenty seven contact Minneapolis Approach one two one point two goodday.

08:27:52.5  
**RDO-2** twenty one two Options three twenty seven goodday.

08:28:03.4  
**RDO-2** good morning Minneapolis Options three twenty seven's eleven for eight with Victor.

08:28:08.0  
**APR-MIN** Options three twenty seven approach plan the ILS runway one zero right approach.

08:28:12.5  
**RDO-2** one zero right ILS Options three twenty seven.

08:28:15.7  
**APR-MIN** Options three twenty seven depart AGUDE heading two five zero.

08:28:19.2  
**RDO-2** two five zero at AGUDE Options three twenty seven.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:28:26.1

**HOT-1** two fitty.

08:28:27.8

**HOT-2** two fifty. two fifty.

08:28:28.2

**HOT-1** there I go.

08:28:29.2

**HOT-1** [laughter] it's good thing you said depart heading two fifty that reminded me oh yeah # I gotta slow down.

08:28:32.6

**HOT-2** [laughter].

08:28:32.7

**CAM** [sound of decreased air noise]

08:28:58.3

**HOT-1** made it. phew.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:29:11.1

**APR-MIN** Medivac seven bravo alpha turn right heading two one zero.

08:29:14.8

**AC-7BA** two one zero seven bravo alpha.

08:29:36.5

**HOT-2** how did ya' get behind schedule? [laughter]

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:29:42.2

**HOT-2** well we were cruisin'. it may have been that different arrival they put us on. [sound of tone, similar to altitude alert]. nine for eight.

08:29:48.2

**HOT-1** nine for eight.

08:29:52.5

**HOT-2** alright I'll be off I'll try Elliott.

08:29:55.3

**HOT-1** yep.

08:30:18.0

**CAM** [sound of knob movement]

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:30:07.6

**RDO-2** Elliott Aviation Flying Cloud Options three twenty seven.

08:30:15.2

**RDO-FBO** Flight Options this is Elliott go ahead.

08:30:17.3

**APR-MIN** Options three twenty seven descend and maintain four thousand.

08:30:18.3

**RDO-2** yes ma'am we're probably twenty minutes out. we'll be with ya on the ground for about an hour. pickin' up four people. we need a fuel truck and a power cart standing by wh-- upon arrival please.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:30:52.1  
**HOT-2** I'm back. they know we're comin'. I asked for a powercart standing by on the fuel truck. and they're in the northeast corner is all she could tell me.

08:30:59.3  
**HOT-2** [laughter]

08:30:59.3  
**HOT-1** okay. nice.

08:31:03.0  
**HOT-1** I'm right here. [laughter]

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:30:20.3  
**RDO-1** four thousand three twenty seven.

08:30:30.0  
**RDO-FBO** okay that's arrival in twenty minutes. you'll be with us for one hour. picking up passengers. requesting a GPU and a fuel truck on standby.

08:30:37.9  
**RDO-2** yes ma'am what taxiway are you off of?

08:30:41.1  
**RDO-FBO** we're on the northeast corner.

08:30:44.2  
**RDO-2** northeast corner thank you.

08:30:46.2  
**RDO-FBO** thank you see you shortly.



**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:31:05.3

**CAM-2** [cough]

08:31:05.7

**HOT-1** that help's me a lot honey.

08:31:10.7

**HOT-2** I tried to ask her what taxiway she was off of.

08:31:14.0

**HOT-2** [laughter]

08:31:16.0

**HOT-1** look out the window # what'dya see.

08:31:18.5

**CAM** [sound of click]

08:31:19.4

**HOT-1** birds.

08:31:21.5

**HOT-2** alright I see four thousand.

08:31:23.8

**HOT-1** you do actually. we're on that two fitty heading and uh four thousand.

08:31:28.2

**HOT-2** alright you want me to activate vectors to final?

08:31:30.3

**HOT-1** ah looks like you can do that. yeah.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:31:38.8

**HOT-1** ba woom bah.

08:31:39.8

**HOT-2** I see green needles.

08:31:56.7

**HOT-1** oh # we're not out of here till fifteen hundred.

08:31:59.4

**HOT-2** yeah we had an hour and half when we got here but I told her only an hour [laughter].

08:32:05.4

**HOT-1** yeah they may show up early to ask questions so.

08:32:07.8

**HOT-2** yeah.

08:32:08.4

**HOT-1** it is a demo.

08:32:10.7

**HOT-2** yep yep.

08:32:18.5

**CAM-?** [sniffle]

08:32:18.6

**HOT-2** oh my nose is tryin' to run.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:32:20.7

**HOT-1** try not to tell them the truth. tell them you love this airplane  
[laughter].

08:32:24.1

**HOT-2** oh yeah.

08:32:27.7

**HOT-2** they're part of that paycheck system I think [laughter].

08:32:31.3

**HOT-1** exactly.

08:32:38.5

**HOT-1** busy this morning up here.

08:32:42.2

**HOT-2** [yawning] five for four.

08:32:42.2

**HOT-1** yeah. (of course). yeah there's five for four. there's ah...

08:32:42.4

**HOT** [sound of tone, similar to altitude alert]

08:32:49.7

**HOT-1** three airports within-- [chuckle]. three big airports within a  
short amount so.

08:32:55.2

**HOT-2** yeah.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:34:28.1  
**HOT-1** [groaning] not bad I hope this sticks. two legs and to the hotel.

08:34:32.2  
**HOT-2** yep. me and you both.

08:34:36.4  
**HOT-1** and I'll probably find out tonight whether I'm going home tomorrow or not.

08:34:40.9  
**HOT-2** now we're under the class B.

08:34:42.8  
**HOT-1** we are?

08:34:44.1  
**CAM** [sound of decreased air noise]

08:34:44.5  
**HOT-2** yeah ten to seven out here.

08:34:45.1  
**HOT-1** rat bastards.

08:34:53.3  
**HOT-1** can't believe they put us under.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:33:44.1  
**APR-MIN** Medivac seven bravo alpha turn right heading two eight zero.

08:33:48.8  
**AC-7BA** two eight zero seven bravo alpha.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:35:01.5

**HOT-2** now it's changed.

08:35:01.9

**HOT-1** no yeah we're in. we're back in. it's four thousand.

08:35:06.3

**HOT-2** yep.

08:35:07.5

**HOT-2** it was seven. I guess it was just not quite there yet.

08:35:09.1

**HOT-1** ohh.

08:35:15.2

**HOT-1** well they didn't yell at me so.

08:35:17.2

**HOT-2** well they may not.

08:35:18.8

**HOT-1** they never do.

08:35:35.4

**HOT-1** [quietly] what's the next one. three and...

08:35:39.8

**HOT-1** twenty three so I'm good for a while.

08:35:41.9

**HOT-2** yeah you should get all the way through now.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:35:44.0

**HOT-1** should be.

08:35:44.5

**HOT-2** I mean. I [stammer] don't even remember if I've even been there. I've been to the one down here.

08:35:48.9

**HOT-1** yeah Saint Paul.

08:35:50.2

**HOT-2** yeah.

08:35:50.6

**HOT-1** yeah I've been there I just oh my gosh. it's been a loong # time.

08:35:52.0

**HOT-2** (I think I have).

08:35:56.1

**HOT-1** it was weird I switched I switched this airplane from the Beechjet and it was like I just never went to Minneapolis again.

08:36:01.0

**HOT-2** that's off the river isn't it? it's right beside the river?

08:36:06.1

**HOT-1** Saint Paul is.

08:36:08.3

**HOT-1** well.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:36:09.3  
**HOT-1** Flying Cloud is problem is there's a lot of Lakes and.

08:36:12.7  
**HOT-2** yea.

08:36:13.8  
**HOT-2** yeah there's the river right there.

08:36:15.9  
**HOT-2** yeah okay.

08:37:38.0  
**HOT-1** okay.

08:37:47.6  
**HOT-1** hate that. it's in that middle.

08:37:50.0  
**HOT-2** yep.

08:37:50.6  
**HOT-1** don't need really need these sunglasses but...

08:37:54.9  
**HOT-1** hey I see MSP.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:37:20.5  
**APR-MIN** Options three twenty seven traffic at your eleven o'clock and seven miles northeast bound is a Citation at five thousand.

08:37:26.5  
**RDO-2** we're lookin' Options three twenty seven.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:37:57.3

**HOT-2** uh-oh.

08:38:10.0

**HOT-2** windshield heat.

08:38:12.3

**CAM** [sound of click]

08:38:13.0

**HOT-2** off.

08:38:14.5

**HOT-1** there he is.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:38:15.8

**APR-MIN** Medivac seven bravo alpha turn ten degrees right.

08:38:18.6

**AC-7BA** ten right seven bravo alpha.

08:38:19.1

**HOT-2** that's eleven o'clock [laughter].

08:38:21.4

**HOT-1** yeah that's what I was lookin' at that. I was lookin' at that goin'.

08:38:23.0

**HOT-2** I know.

08:38:24.6

**HOT-1** eleven what the # is he talkin' about.



**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:38:26.8

**HOT-2** (did) he call(ed) him at we were at his eleven o'clock so I knew something was screwy.

08:38:35.5

**HOT-1** right over the top.

08:38:36.7

**HOT-2** yep yep.

08:38:38.1

**HOT-1** oh I tell you what though I didn't miss goin' comin' here in the winter.

08:38:41.3

**HOT-2** oh I know.

08:38:43.1

**HOT-1** holy # that's--

08:38:44.0

**APR-MIN** Options three twenty seven traffic no factor.

08:38:46.9

**RDO-2** three twenty seven.

08:38:49.9

**HOT-1** I showed up here one day. droppin' people off. and it wasn't @ either. and uhm pulled up on the ramp. opened the door. # minus forty without the wind chill.

08:39:00.3

**APR-MIN** Options three twenty seven turn ten degrees right.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:39:08.2

**HOT-1** you you breathe and your nose would stick together.

08:39:11.0

**HOT-2** oh I know.

08:39:11.7

**HOT-1** [laughter] it was nasty.

08:39:14.1

**HOT-1** and then the customers got off and they were like ahhhhh  
[laughter].

08:39:17.6

**HOT-2** [laughter]

08:39:18.8

**HOT-1** yeah they I'm pretty sure they weren't from here. they were  
comin' here to do some sort of business...

08:39:22.7

**HOT-2** yeah.

08:39:23.1

**HOT-1** I was like oh yeah welcome to Minneapolis.

08:39:55.2

**HOT-1** I got my bling goin' here.

08:39:02.6

**RDO-2** ten right Options three twenty seven.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:39:57.1  
**HOT-2** that thing is so aggravating.

08:40:01.9  
**CAM** [sound of knob movement]

08:40:06.2  
**HOT-2** two twenty.

08:40:12.5  
**HOT-1** oh man I forgot to send that email. I was gonna send an email to...I guess it's not too late.

08:40:17.9  
**HOT-1** # yeah it is.

08:40:18.2  
**HOT-2** yeah you're too busy right now.

08:40:20.9  
**HOT-1** yeah exactly. yeah I'm. I don't know why I just thought about that the Global.

08:40:25.6  
**HOT-1** I was gonna tell the ah owner @@ that that was a Global we were looking at.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:39:58.2  
**APR-MIN** Options three twenty seven fly heading two two zero.

08:40:00.6  
**RDO-2** two two zero Options three twenty seven.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:40:30.3  
**HOT-2** oh.

08:40:31.3  
**HOT-1** just a courtesy thing not a pphht.

08:41:23.5  
**HOT-1** there's an airplane right there.

08:41:25.3  
**HOT-2** they be.

08:41:26.7  
**HOT-2** I see some (rain clouds) over here.

08:41:30.8  
**HOT-1** yeah.

08:41:30.9  
**HOT-2** I have (an) airport.

08:41:32.2  
**HOT-1** oh that's really cool.

08:41:34.0  
**HOT-2** I got the airport.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:40:51.0  
**APR-MIN** Medivac seven bravo alpha turn right heading three six zero.

08:40:54.1  
**AC-7BA** right turn three six zero seven bravo alpha.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:41:35.3  
**HOT-1** cool.

08:41:36.2  
**HOT-1** call it.

08:41:36.3  
**HOT-2** \*\*.

08:41:36.9  
**HOT-2** [cough] but you won't be able to maintain it.

08:41:53.5  
**HOT-1** oh so I should slow down? is what you're saying?

08:41:55.7  
**HOT-2** ahhhhh Ill'm ridin'. [laughter]

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:41:37.6  
**APR-MIN** Options three twenty seven traffic eleven o'clock two miles southbound is a Citation at three thousand. he'll be climbing to the southeast here momentarily.

08:41:45.3  
**RDO-2** in sight Options three twenty seven.

08:41:47.8  
**APR-MIN** and Options three twenty seven turn right heading two five zero.

08:41:51.1  
**RDO-2** two five zero Options three twenty seven.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:41:56.4

**CAM** [sound of decrease in air noise]

08:41:56.9

**HOT-1** [laughter].

08:42:01.0

**HOT-2** see there it is but you can look out there now and you (won't) be able to see it.

08:42:02.1

**HOT-1** yeah.

08:42:07.8

**HOT-1** I'll slow down now...it's time.

08:42:15.8

**HOT-1** yeah we could maintain a visual if you want to call it.

08:42:19.4

**HOT-2** think you can? I'll call it if you think you can.

08:42:21.7

**HOT-1** oh hell yeah. that's thin enough. that's not even a layer.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:42:16.1

**APR-MIN** Medivac seven bravo alpha turn right heading zero eight zero and join the runway one zero right localizer.

08:42:20.8

**AC-7BA** zero eight zero to join Medivac seven bravo alpha.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:42:36.9  
**HOT-1** oh cancel that [chuckle].

08:42:38.3  
**HOT-2** [chuckle].

08:42:45.7  
**HOT-1** but...I'll still go slow enough so that uh I won't be way the hell out.

08:42:50.9  
**HOT-2** thank you.

08:43:21.9  
**HOT-1** it is beautiful up here in the summer.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:42:29.6  
**APR-MIN** and Medivac seven bravo alpha you're three miles from STUBR maintain three thousand till established on the localizer. cleared ILS runway one zero right approach.

08:42:36.8  
**AC-7BA** maintain three thousand till established cleared for the ILS ten right approach for seven bravo alpha.

08:43:03.1  
**APR-MIN** Medivac seven bravo alpha contact Flying Cloud Tower one one nine point one five.

08:43:06.9  
**AC-7BA** nineteen fifteen seven bravo alpha have a great day.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:43:24.8

**HOT-2** at times.

08:43:25.9

**HOT-1** [laughter].

08:43:29.0

**HOT-1** yep. sometimes they don't even get a summer. they just kind'a get a--

08:43:33.0

**HOT-2** yep.

08:43:35.2

**CAM** [sound of knob movement]

08:43:39.4

**CAM** [sound of knob movement]

08:43:41.2

**HOT-1** can't believe that # is doing the ILS.

08:43:44.5

**HOT-2** well he may have come in from a different direction too.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:43:32.3

**APR-MIN**

Options three twenty seven turn right heading two eight zero descend and maintain three thousand.

08:43:36.5

**RDO-2**

three thousand two eighty on the heading Options three twenty seven.



**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:43:51.2

**HOT-1** well it doesn't matter he's letting' him go before us so.

08:43:53.4

**HOT-2** yeh. I can't even see the airport now either.

08:44:01.0

**HOT-1** it's back there.

08:44:03.2

**HOT-2** yep yep.

08:44:03.4

**HOT-1** you should you should see him he's ah he should be right out  
your window there.

08:44:08.5

**HOT-1** yep. right there. boom.

08:44:09.5

**HOT-2** you see him?

08:44:11.7

**HOT-2** alright gotch'ya.

08:44:14.2

**HOT-1** yeah tell him we ah have him in sight and ask for a visual.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:44:17.4

**RDO-2** and Options three twenty seven has the ah traffic in sight and  
we have the airport also.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:44:24.6  
**CAM** [sound of knob movement for about 6 seconds]

08:44:50.2  
**HOT-?** \*

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:44:22.0  
**APR-MIN** Options three twenty seven roger turn right heading of ah zero six zero and follow the King Air cleared visual approach runway one zero right.

08:44:28.6  
**RDO-2** zero six zero cleared for the visual one zero right Options three twenty seven.

08:44:32.9  
**APR-MIN** Options three twenty seven just follow the King Air please.

08:44:35.5  
**RDO-2** okay behind the King Air Options three twenty seven.

08:44:49.5  
**APR-MIN** Options three twenty seven contact Flying Cloud Tower on ah one one nine point ah one five and just let him know that ah your following the King Air visually please.

08:44:59.3  
**RDO-2** nineteen fifteen Options three twenty seven good morning.

08:45:08.1  
**RDO-2** Tower Options three twenty seven is visual one zero right behind the King Air.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:45:22.5  
**HOT-1** cool. cleared to land.

08:45:28.9  
**HOT-1** oooh. yeah. # it's right up in that hole.

08:45:33.1  
**HOT-1** I can se-- I can see it from here.

08:45:36.3  
**HOT-1** I'm gonna tweak this a little bit so it doesn't...

08:45:36.4  
**CAM** [sound of knob movement]

08:45:44.1  
**HOT-1** oh.

08:45:45.7  
**HOT-1** actually ah closer than I thought. go ahead gear down.

08:45:49.7  
**CAM** [sound of click, similar to gear handle]

08:45:50.8  
**CAM** [sound of increased air noise, similar to gear extension]

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:45:14.1  
**TWR** Options three twenty seven Flying Cloud Tower number two  
runway one zero right cleared to land.

08:45:19.7  
**RDO-2** cleared to land one zero right Options three twenty seven.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:45:51.3

**HOT-1** flaps ah. yeah I'm gonna kick that off.

08:45:53.9

**AWU** autopilot.

08:45:54.1

**HOT-1** flaps one.

08:45:54.8

**CAM** [sound of click]

08:45:58.5

**HOT-1** # I was thinkin' it was farther up.

08:46:01.0

**HOT-2** aw that's why I say you couldn't see it [chuckle].

08:46:03.5

**HOT-1** I can see it now.

08:46:04.6

**HOT-2** here comes our glideslope so your alright.

08:46:06.1

**HOT** [sound of tone, similar to altitude alert]

08:46:08.7

**HOT-1** unless there's not an airport between us is there. no. \*.

08:46:11.4

**HOT-2** not to my knowledge. you're on the glideslope.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:46:13.5

**HOT-1** ah that's wh-- no but that doesn't look right.

08:46:18.7

**HOT-1** that's the airport right here right?

08:46:20.2

**HOT-2** you're still on the glideslope.

08:46:22.7

**HOT-2** do you see a left and a right?

08:46:26.2

**HOT-2** there it goes up now.

08:46:28.3

**HOT-1** see what the hell. isn't that it right dead ahead of me?

08:46:31.1

**HOT-2** that's what it's showin'.

08:46:32.8

**HOT-1** I think we're too high I think that's why we were \*--'cause I see the vasi and..

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:46:24.5

**TWR**

Medivac King Air seven bravo alpha turn right exit and taxi to Executive via Charlie remain this frequency.

08:46:31.0

**AC-7BA**

right on Charlie with you to Exec.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:46:35.7

**HOT** [sound of tone, similar to altitude alert] [pause of .1 seconds]  
[sound of tone, similar to altitude alert]

08:46:38.0

**AWU** altitude.

08:46:38.4

**HOT-1** I'm gonna down and then ah pull up to--.

08:46:39.0

**AWU** sink rate.

08:46:40.5

**AWU** whoop whoop pull up.

08:46:41.4

**HOT-2** that's fine. that's fine.

08:46:42.1

**HOT-1** yeaah.

08:46:45.3

**HOT-2** alright.

08:46:45.7

**AWU** whoop whoop pull up.

08:46:46.9

**HOT-1** (naw) that's it.

08:46:47.8

**HOT-2** landing lights are on. cross feed knob.

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:46:50.2

**HOT-1** is off.

08:46:50.7

**AWU** whoop whoop pull up.

08:46:51.0

**HOT-2** windshield heat.

08:46:52.7

**HOT-1** is ah off.

08:46:55.4

**HOT-2** nav source is verified. landing gear.

08:46:55.7

**AWU** whoop whoop pull up.

08:46:57.9

**HOT-1** down and three green and I'll get you're flaps here in just a second.

08:47:00.1

**AWU** whoop whoop pull up.

08:47:01.8

**CAM** [sound of click]

08:47:02.3

**HOT-1** one set once I start gettin' ah.

08:47:02.5

**AWU** high speed. high speed.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:47:04.8

**HOT-2** yep.

08:47:05.1

**AWU** high speed.

08:47:05.5

**HOT-1** there we go. now I can--

08:47:05.5

**AWU** whoop whoop pull up.

08:47:07.5

**AWU** high speed. high speed.

08:47:08.6

**HOT-1** #.

08:47:10.6

**AWU** whoop whoop pull up.

08:47:12.2

**HOT-1** ah balls.

08:47:12.5

**AWU** too low. terrain.

08:47:13.2

**HOT-2** you're stabilized.

08:47:14.2

**AWU** two hundred.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**



**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:47:15.2

**HOT-1** yeh go ahead flapssss...two.

08:47:16.7

**AWU** too low terrain.

08:47:17.9

**CAM** [sound of click, similar to flap handle movement]

08:47:18.4

**AWU** one hundred.

08:47:18.9

**HOT-1** and three.

08:47:19.8

**CAM** [sound of click]

08:47:21.5

**HOT-1** #.

08:47:21.5

**AWU** glide slope.

08:47:28.6

**CAM** [sound of rumble, similar to touchdown and wheel spin up]

08:47:29.7

**AWU** flight director.

08:47:33.7

**CAM** [sound of decreased rumble, similar to deceleration]

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:47:40.6

**HOT-2** comin' up quick.

08:47:42.2

**HOT-1** #.

08:47:43.5

**HOT-2** aw hell.

08:47:44.3

**HOT-1** oh I'm not gonna make it.

08:47:46.7

**HOT-1** nope. I got it.

08:47:47.6

**HOT-2** okay here \*.

08:47:48.1

**HOT-1** aw #.

08:47:48.4

**HOT** [sound of chime, similar to a crew alert message (i.e., EICAS)]

08:47:49.8

**CAM** [sound of increased rumbling, similar to leaving paved surface, continues for about 15.5 seconds]

08:47:51.5

**HOT-1** son-of-a-#.

08:47:53.6

**HOT** [sound of chime, similar to a crew alert message (i.e., EICAS)]

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:47:58.1

**HOT-1** yes.

08:47:58.6

**HOT-?** [grunt]

08:47:58.8

**HOT** [sound of chime, similar to a crew alert message (i.e., EICAS)]

08:47:59.0

**HOT-?** ahh.

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:47:56.3

**TWR**

Options three twenty seven do you need any assistance sir?

08:48:00.7

**RDO-2**

(on fire) three twenty seven.

08:48:01.8

**CAM** [sound of momentary increase in rumbling, similar to further impact with ground related objects]

08:48:02.8

**HOT** [sound of multiple snaps]

08:48:03.8

**HOT** [sound of chime, similar to a crew alert message (i.e., EICAS)]

08:48:05.4

**CAM** [sound of rumbling decreases, similar to aircraft coming to a stop]

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**

08:48:05.6

**HOT-1** oh well...#.

08:48:08.4

**CAM-2** God #.

08:48:08.8

**HOT** [sound of chime, similar to a crew alert message (i.e., EICAS)]

08:48:10.8

**HOT-1** turn those off. yep thank you.

08:48:12.8

**CAM** [sound of decreased engine noise, similar to engines spooling down]

08:48:14.0

**HOT** [sound of chime, similar to a crew alert message (i.e., EICAS)]

08:48:14.4

**HOT-2** aw man.

08:48:15.9

**HOT-1** #.

08:48:16.3

**HOT-2** goin' out the door.

08:48:18.1

**CAM** [sound of clicks, similar to seat belts]

08:48:19.1

**HOT** [sound of chime, similar to a crew alert message (i.e., EICAS)]

**TIME and  
SOURCE**

**INTRA-COCKPIT CONTENT**

08:48:19.7

**CAM-2** batteries.

08:48:23.5

**CAM-2** God #--. [power interrupted to CVR]

**END OF TRANSCRIPT**

08:48:24.0 CDT

**END OF RECORDING**

02:04:14 CVR Elapsed Time

**TIME and  
SOURCE**

**AIR-GROUND COMMUNICATION CONTENT**