National Transportation Safety Board

Office of Research and Engineering

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COCKPIT VOICE RECORDER

Group Chair's Factual Report

May 29, 2024

WARNING

The reader of this report is cautioned that the summary and transcript of a cockpit voice recorder audio recording is not a precise science but is the best product possible from a National Transportation Safety Board group investigative effort. The summary and transcript or parts thereof, if taken out of context, could be misleading. The summary and 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 summary and transcript as the sole source of information.

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A. ACCIDENT

Location:	Naples, FL
Date:	February 9, 2024
Time:	1517 Eastern Standard Time (EST) 2017 Coordinated Universal Time (UTC)
Airplane:	Bombardier Challenger 604, N823KD

B. COCKPIT VOICE RECORDER GROUP

Group Chair	Olivia Fowler Mechanical Engineer – Recorder Specialist National Transportation Safety Board (NTSB)
Group Member	Anthony Donato Line Captain Ace Aviation Services dba Hop-A-Jet
Group Member	Andrew Field Air Safety Investigator Bombardier Aviation
Group Member	Todd Gentry Senior Air and Space Accident Investigator FAA
Group Member	Walter Moeller Technical Pilot GE Aerospace

C. FEDERAL CARRIAGE REQUIREMENTS

The event aircraft, N823KD, was operating under Title 14 *Code of Federal Regulations* (CFR) Part 135. The event aircraft was manufactured in 2005 and was operating such that it was required to be equipped with a cockpit voice recorder (CVR) that records a minimum of the last 30 minutes of aircraft operation.

D. DETAILS OF THE INVESTIGATION

A CVR group was convened on March 5, 2024. The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model: L-3 FA2100
Part Number: 2100-1225-22
Recorder Serial Number: 001146822

1.0 Recorder Description

This model CVR, the L-3 FA2100-1225, records a minimum of 120 minutes of digital audio stored on solid state memory modules. Four channels are recorded: one channel for each flight crew, one channel for a cockpit observer, and one channel for the cockpit area microphone (CAM).

1.1 Recorder Damage

Upon arrival at the laboratory, it was evident that the CVR exhibited signs of minor sooting but otherwise had not sustained any heat or structural damage. The audio information was extracted from the recorder normally, without difficulty.

1.2 Audio Recording Description

Each channel's audio quality is indicated in Table 1.[1] Channel number three did not contain any audio information (nor was it required by federal regulations).

Table 1. Audio Quality

Channel Number	Content/Source	Quality	Duration (hh:mm:ss)
1	Captain	Excellent	02:03:53
2	First Officer	Excellent	02:03:53
3	Unused	N/A	02:03:53
4	CAM	Good	02:03:49

1.3 Timing and Correlation

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, five radio transmissions that the aircraft made near the end of the flight were correlated to the radio transmit microphone key parameter from the FDR. Each of the five radio transmissions acted as an anchor point for a linear interpolation between the remaining CVR events. Once a correlation between the two recorders was established, a reference to local time was determined. The CVR and FDR times were offset to reflect the local eastern standard time of the accident.

[1] Appendix A comprises the CVR Quality Rating Scale.

1.4 Description of Audio Events

The accident aircraft's radio callsign was Hopajet 823.

A summary of the CVR Events is as follows.

The recording began at 13:06:56 during climb.

At 13:10:00, the first officer alludes to the completion of the climb check.

Around 13:11, Indianapolis Center cleared Hopajet 823 to climb to Flight Level 340 (FL340). There was some discussion of turbulence between the controller and several aircraft on the radio. Hopajet 823 switched to a different Indianapolis Center frequency and requested FL400.

Around 13:20, the crew discussed NetJets operations and fuel options at Naples but mentioned that they didn't need fuel this trip.

At 13:34:06, the first officer alluded to the completion of the cruise check.

At 13:36:40, the crew mentioned that they planned to use RNAV 5 instrument approach at Naples.

The flight proceeded uneventfully with very little conversation as they traveled from Indianapolis Center through Atlanta and Jacksonville to Miami Center.

Around 14:38, the crew switched to Miami Center and reported leaving FL370 for FL350.

Around 14:40 the crew tuned the Automatic Terminal Information Service (ATIS) frequency for Naples, which was reporting information Hotel. ATIS information Hotel reported winds from 190 degrees at 7 kts, clouds scattered at 4,800 feet, and that runway 23 was the active runway. It also reported birds and wildlife as well as construction cranes in the vicinity of the airport.

The transcript begins at 14:41:41 with the aircraft descending to FL250 on approach to Naples.

Submitted by:

Olivia Fowler
Mechanical Engineer – Vehicle Recorders

APPENDIX A. 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.

APPENDIX B. CVR TRANSCRIPT

The following is a transcript of an L-3 FA2100-1225 solid state cockpit voice recorder, serial number 001146822, installed on a Bombardier Challenger 604, N823KD, operated by Ace Aviation Services (dba Hop-A-Jet Worldwide Jet Services), which crashed on February 9, 2024, in Naples, FL.

LEGEND

CAM	Cockpit area microphone voice or sound source
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from K823KD
MIA	Radio transmission from the Miami Center controller
FMY	Radio transmission from the Fort Myers Approach controller
TWR	Radio transmission from the KAPF airport tower controller
ATIS	Automated Terminal Information Service for KAPF Airport
N874BH	Radio transmissions from other aircraft in the area, N874BH
EGPWS	Enhanced Ground Proximity Warning System
-1	Voice identified as the captain
-2	Voice identified as the first officer
-3	Voice identified as the flight attendant
-?	Voice unidentified
-A	First identified facility controller
-B	Second identified facility controller
*****	Unintelligible word
#	Expletive
@	Non-pertinent word
( )	Questionable insertion
[ ]	Editorial insertion

Note 1: Times are expressed in eastern standard time.

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-Aircraft Communication	Time and Source	Over-the-Air Communication
13:06:55.6 **START OF TRANSCRIPT**			
14:41:41.4 **HOT-1**	one nine zero at what?		
14:41:43.2 **HOT-2**	uh one nine yeah let's get this in here uh one nine zero at uh seven.		
14:41:49.4 **HOT-1**	mhmm.		
14:41:50.0 **HOT-2**	yeah that's it.		
14:41:51.4 **HOT-1**	temperature?		
14:41:52.6 **HOT-2**	uh temperature is uh two five.		
14:41:57.9 **HOT-1**	altimeter?		
14:41:59.2 **HOT-2**	three zero one five.		
14:42:02.7 **HOT-2**	yep right that's all changed uh * * we got that okay all right all there.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:42:16.3 **CAM**	[sound similar to altitude alert]		
14:42:18.9 **HOT-1**	one to go.		
14:42:19.6 **HOT-2**	one to go.		
14:42:26.8 **HOT-2**	do this * doo doo doo we got the A-TIS. CAS looks clear. G-P-W-S landing data is set.		
14:42:39.2 **HOT-1**	one twenty checks.		
14:42:40.7 **HOT-2**	'kay approach briefing.		
14:42:42.7 **HOT-1**	visual.		
14:42:43.4 **HOT-2**	yep.		
14:42:43.6 **HOT-1**	two three backed up by the R-NAV.		
14:42:45.4 **HOT-2**	check. shoulder harnesses will be… pressurization is descending. windshield heat still on high oh should we try low…		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:42:58.4 **HOT-1**	yep.		
14:42:59.2 **HOT-2**	see what happens.		
14:42:59.8 **HOT-1**	*. [sound similar to sniffle]		
14:43:01.5 **HOT-2**	fuel quantity and balance…close…and altimeters to go.		
14:43:11.5 **HOT-1**	roger.		
14:43:17.8 **CAM**	[sounds of clunking]		
		14:43:24.5 **MIA**	Hopajet eight two three squawk two one four five.
		14:43:27.7 **RDO-2**	two one four five Hopajet eight two three.
14:43:32.4 **HOT-2**	two–		
		14:43:34.6 **MIA**	Hopajet eight two three cross CODGR at flight level two five zero.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:43:38.7 **HOT-1**	CODGR.		
		14:43:39.4 **RDO-2**	CODGR at and maintain flight level two five zero Hopajet eight two three.
14:43:58.5 **HOT-2**	(well/oh) time to go down.		
14:43:59.9 **CAM**	[sounds similar to engine acoustic beating/out of sync]		
14:44:02.2 **HOT-2**	(there/they're) perfect.		
14:44:34.8 **CAM**	[sounds consistent with slow engine rpm decrease]		
14:44:51.0 **HOT-1**	[sound of sniffle]		
		14:45:21.8 **MIA-A**	Hopajet eight twenty three contact Miami Center one three two point three five.
		14:45:26.4 **RDO-2**	one three two point three five Hopajet eight twenty three.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		14:45:39.7 **RDO-2**	Miami Center Hopajet eight twenty three is with you uh twenty nine three descending across CODGR at and maintain flight level two five zero.
		14:45:47.5 **MIA-B**	Hopajet eight twenty three Miami Center roger.
		14:45:55.4 **MIA-B**	Hopajet eight twenty three clear direct ZEILR at this time cross ZEILR at and maintain one one thousand.
		14:46:01.4 **RDO-1**	direct ZEILR cross ZEILR at one one thousand Hopajet eight two three.
14:46:03.3 **HOT-2**	okay ZEILR.		
14:46:23.4 **HOT-2**	check.		
14:46:26.9 **HOT-1**	[sound of sniffle]		
14:47:39.2 **HOT-1**	[sound of sniffle]		
14:49:22.9 **HOT-1**	[sound of sniffle]		
14:51:41.6 **HOT-2**	[sound similar to yawn]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:51:57.8 **HOT-2**	okay three zero one nine.		
14:52:01.3 **HOT-1**	one– one nine or one five?		
14:52:03.5 **HOT-2**	uh one five at the– what did he say? one five at the airport...uh did he say one nine? ah.		
		14:52:17.7 **RDO-2**	and what was the uh local altimeter Hopajet eight twenty three?
		14:52:20.8 **MIA-B**	uh local altimeter three zero one six.
		14:52:23.1 **RDO-2**	one six thank you.
14:52:24.9 **HOT-1**	* checks.		
14:52:25.9 **HOT-2**	one six set.		
14:52:38.4 **CAM**	[sound of clunk]		
14:52:44.3 **HOT-2**	uhhhh call…all right.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:53:03.8 **HOT-1**	now this time I don't want you to change that to that until…		
14:53:07.6 **HOT-2**	right.		
14:53:09.3 **HOT-2**	'til you have a blue gen–		
14:53:10.4 **HOT-1**	…'til you have, no, 'til you have one hundred percent.		
14:53:12.6 **HOT-2**	yeah.		
14:53:13.3 **HOT-1**	then you can switch and see you got blue then go about your business.		
14:53:16.9 **HOT-2**	right right.		
14:53:17.9 **HOT-1**	I think that's what screwed you up. you had that up.		
14:53:19.8 **HOT-2**	yeah.		
14:53:20.2 **HOT-1**	I turned it off because I wanted to see this.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:53:22.1 **HOT-2**	yeah.		
14:53:22.3 **HOT-1**	while you're waiting.		
14:53:23.4 **HOT-2**	right.		
14:53:24.4 **HOT-1**	you know I don't need to watch that I need to watch this.		
14:53:25.1 **HOT-2**	yeah.		
14:53:27.3 **HOT-2**	yeah ninety five percent for four seconds then you have a hundred percent– and you– is that what you're saying? it will be fully up to speed avail at that point right?		
14:53:36.7 **HOT-1**	yeah once…		
14:53:37.2 **HOT-2**	yeah.		
14:53:37.3 **HOT-1**	…once you get– you generally from ninety nine to a hundred percent…		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:53:40.5 **HOT-2**	yeah.		
14:53:41.1 **HOT-1**	…but you don't need to watch that…		
14:53:43.0 **HOT-2**	uh huh.		
14:53:43.4 **HOT-1**	…up until it's up at a hundred percent.		
14:53:45.4 **HOT-2**	okay.		
14:53:46.6 **HOT-1**	so just start it, wait 'til it gets to a hundred then switch.		
14:53:48.8 **HOT-2**	okay.		
14:53:49.4 **HOT-1**	then do that.		
14:53:50.0 **HOT-2**	gotchu all right.		
14:53:54.5 **HOT-2**	I got a little bit out of practice.		
14:53:56.3 **HOT-1**	yeah.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
14:53:56.5 **HOT-2**	sittin' at sittin' at home lately you know. [sound of chuckle]		
14:54:09.5 **CAM**	[sound of double click]		
14:54:17.2 **HOT-1**	[sound of sniffle]		
14:54:36.0 **HOT-2**	uhh tut tut.		
14:55:00.5 **HOT-2**	uhh Fort Myers Approach twenty four twelve.		
		14:55:19.6 **MIA-B**	Hopajet eight twenty three contact Fort Myers Approach one three four point four two.
		14:55:25.0 **RDO-2**	one three four point four two g'day Hopajet eight twenty three.
		14:55:41.3 **RDO-2**	Fort Myers Approach Hopajet eight twenty three with you we are uh at one three thousand three hundred descending to cross ZEILR at and maintain one one thousand information Hotel.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		14:55:51.6 **FMY**	Hopajet eight twenty three Fort Myers Approach altimeter three zero one five descend and maintain five thousand.
14:55:54.0 **CAM**	[sounds consistent with engine acoustic beating]		
		14:55:56.2 **RDO-2**	three zero one five descending five thousand Hopajet eight twenty three.
14:55:59.6 **HOT-1**	five thousand.		
14:56:00.7 **HOT-2**	and five thousand.		
14:56:03.6 **HOT-2**	three zero one five.		
14:56:58.6 **CAM**	[sound of clunk]		
14:57:07.6 **CAM**	[sound of thumps]		
		14:57:52.7 **FMY**	Hopajet eight two three uh good rate down to– actually you know what just a standard descent is fine there– descend and maintain five thousand thanks.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		14:58:00.3 **RDO-2**	okay we're descending uh five thousand Hopajet eight twenty three.
14:58:04.9 **HOT-1**	all right outta ten let's do an in range please.		
14:58:07.9 **HOT-2**	'kay in range uhh recall A-P-U if required start.		
14:58:45.8 **HOT-1**	[sound consistent with sniffle]		
14:58:56.8 **HOT-2**	a hundred okay…all right.		
14:59:20.3 **HOT-2**	uhhh…		
14:59:30.3 **HOT-1**	perfect that's how it's done.		
14:59:31.8 **HOT-2**	all right.		
15:00:40.6 **CAM**	[sound similar to altitude alert]		
15:00:42.2 **HOT-2**	one to go.		
15:00:42.8 **HOT-1**	one to go.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		15:00:57.9 **FMY-A**	Hopajet eight two three contact approach one two four point one two twenty four twelve have a good day.
		15:01:02.3 **RDO-2**	one two four point one two g'day Hopajet eight twenty three.
		15:01:09.6 **RDO-2**	Hopajet eight twenty three five point two descending five thousand.
15:01:16.2 **HOT-2**	[sounds similar to sigh]		
		15:01:17.5 **FMY-B**	Hopajet eight twenty three Fort Myers Approach roger.
15:01:30.6 **HOT-2**	*.		
		15:01:31.2 **ATIS**	approach in use landing and departing runway two three use caution for bird and wildlife activity on and in the vicinity of the airport ground control and clearance delivery are combined on– *– use caution for cranes within the airspace below two hundred and sixty feet A-G-L advise on initial contact you have information Hotel.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:01:49.5 **HOT-2**	[sound of three clicks]		
15:01:50.2 **HOT-2**	still Hotel.		
15:01:54.0 **HOT-1**	[sound of sniffle]		
15:02:13.8 **HOT-1**	[sound of sniffle]		
15:02:22.8 **HOT-2**	[sound of sigh]		
		15:02:53.6 **FMY-B**	Hopajet eight twenty three turn left heading one one zero descend and maintain three thousand.
		15:02:58.7 **RDO-2**	left turn one one zero three thousand Hopajet eight twenty three.
15:03:03.0 **HOT-1**	down to three…one one zero.		
15:03:03.8 **HOT-2**	uh three thousand.		
15:03:06.3 **HOT-1**	straight line.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:03:08.1 **HOT-2**	and you got a straight line comin up here uh…uh...uhhhhh…okay…uh....'kay how's that?		
15:03:25.1 **HOT-1**	looks good.		
		15:03:32.7 **N874BH**	Cirrus eight seven four bravo hotel we were with Miami Center and lost contact uh twenty east of Marco Island. [other aircraft radio call provided for context of crew comment]
		15:03:40.2 **FMY-B**	what's your destination?
		15:03:42.2 **N874BH**	Immokalee four bravo hotel.
15:03:57.8 **HOT-2**	want this on that side or—		
15:03:59.5 **HOT-1**	yeah.		
15:04:07.6 **HOT-2**	Immokalee.		
15:04:12.7 **HOT-2**	one to go.		
15:04:12.9 **CAM**	[sound of tone consistent with altitude alert]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:04:14.7 **HOT-1**	one.		
15:04:35.2 **CAM**	[sound of click-click]		
15:04:39.1 **CAM**	[sound of click]		
15:04:54.3 **CAM**	[sound of chime consistent with master caution]		
15:04:56.5 **HOT-1**	disregard.		
15:04:57.8 **HOT-2**	okay.		
15:05:01.5 **HOT-2**	yeah there's nothing– nothing in there anyways.		
15:05:04.0 **HOT-1**	right.		
		15:05:12.6 **FMY-B**	* Hopajet eight twenty three turn left heading one zero zero.
		15:05:15.8 **RDO-2**	left turn heading one zero zero Hopajet eight twenty three.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:05:19.5 **HOT-1**	one zero zero.		
15:05:20.6 **HOT-2**	one zero zero.		
15:05:29.0 **HOT-1**	[sound of scratch]		
		15:05:41.1 **FMY-B**	Hopajet eight twenty three speed two ten.
		15:05:43.3 **RDO-2**	speed two ten Hopajet eight twenty three.
15:05:46.0 **HOT-1**	two ten.		
15:05:47.4 **HOT-2**	roger.		
15:05:47.8 **CAM**	[sound similar to decreasing engine RPM]		
		15:06:03.9 **FMY-B**	Hopajet eight twenty three descend and maintain two thousand.
		15:06:06.5 **RDO-2**	two thousand Hopajet eight twenty three.
15:06:09.7 **HOT-1**	down to two.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:06:10.8 **HOT-2**	two one to go.		
15:06:20.2 **CAM**	[sound of clunk]		
15:06:28.7 **HOT-1**	flaps twenty.		
15:06:29.8 **HOT-2**	okay speed check flaps selected twenty.		
15:06:46.1 **CAM**	[sound similar to increase in engine RPM]		
		15:06:55.8 **FMY-B**	Hopajet eight twenty three report the airport in sight it is off your uh two o'clock and six miles.
		15:07:01.5 **RDO-2**	airport in sight Hopajet eight twenty three.
		15:07:03.7 **FMY-B**	Hopajet eight twenty three five mile final straight in cleared visual approach runway two three.
		15:07:08.2 **RDO-2**	five mile final straight in cleared visual two three Hopajet eight twenty three.
15:07:14.0 **HOT-2**	thats what he said okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:07:31.5 **CAM**	[sound similar to decreasing engine RPM]		
		15:07:34.8 **FMY-B**	Hopajet eight twenty three there ay is a Pilatus about three mile final ahead of you IFR doing ninety knots over the ground start pulling it back to final please.
		15:07:42.5 **RDO-2**	all right we'll slow back to final Hopajet eight twenty three.
		15:07:45.2 **FMY-B**	let me know if you see that Pilatus he's off your one o'clock (and/at) about uh four miles and nine hundred feet on final.
		15:07:50.5 **RDO-2**	uh okay Hopajet eight twenty three lookin'.
15:08:01.2 **HOT-1**	flaps thirty gear down before landing.		
15:08:05.4 **CAM**	[increase in ambient noise, consistent with landing dear deployment]		
15:08:05.4 **CAM**	[sound of click]		
15:08:13.8 **CAM**	[sound similar to increasing engine RPM]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		15:08:14.3 **FMY-B**	Hopajet eight twenty three the towers gonna provide visually for you just join on the five mile final it shouldn't be a factor. contact tower one two eight point five have a great day.
		15:08:20.7 **RDO-2**	five mile final twenty eight five g'day Hopajet eight twenty three.
15:08:25.8 **HOT-1**	three green I see it.		
15:08:26.8 **HOT-2**	'kay.		
15:08:28.6 **HOT-2**	[sound of sigh]		
		15:08:31.8 **RDO-2**	Hopajet eight twenty three is with you on a right downwind for a five mile final uh runway two three.
		15:08:38.1 **TWR**	Hopajet eight twenty three roger make the right turn back toward the airport at least one departure ahead of you Challenger jet runway two three clear to land winds two two zero at one two gust one six.
15:08:38.1 **CAM**	[sound similar to decreasing engine RPM]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:08:44.9 **CAM**	[sound of click similar to landing light switch]		
		15:08:46.5 **RDO-2**	all right Challenger jet departing we're turning back towards the airport and clear to land runway two three Hopajet eight twenty three.
15:08:53.6 **HOT-1**	clear to land.		
15:08:54.5 **HOT-2**	yeah.		
15:08:55.4 **CAM**	[sound of clicks]		
15:09:01.7 **HOT-2**	I have the runway.		
15:09:03.4 **HOT-2**	got the runway.		
15:09:05.2 **HOT-2**	alrighty…ignition.		
15:09:10.7 **HOT-2**	cabin advise.		
15:09:13.5 **HOT-2**	we want to play it or…oh it's already done, you got it going?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:09:15.4 **CAM**	[sound similar to decreasing engine RPM]		
15:09:16.0 **HOT-1**	no I didn't play it. play it.		
15:09:17.5 **HOT-2**	'kay.		
15:09:18.3 **CAM**	[sounds similar to cavalry charge tone, consistent with autopilot disconnect]		
15:09:19.3 **HOT-1**	landing flaps.		
15:09:21.4 **CAM**	[sound of high-low chime, consistent with seatbelt sound in cabin]		
15:09:22.7 **HOT-2**	all right.		
15:09:23.6 **HOT-1**	landing flaps.		
15:09:23.8 **CAM**	[sound similar to decreasing engine RPM]		
15:09:24.6 **HOT-2**	and landing flaps.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:09:25.0 **CAM**	[sound of click]		
15:09:25.6 **HOT-1**	thank you.		
15:09:26.3 **HOT-2**	all right.		
15:09:27.5 **HOT-2**	landing gear lever uh down indicating.		
15:09:29.9 **CAM**	[engine noise continuing to decrease]		
15:09:31.7 **HOT-2**	three green(?)		
15:09:32.9 **CAM**	[sound of triple chime consistent with master warning]		
15:09:35.3 **HOT-2**	what the hell what– oh right engine just quit.		
15:09:38.3 **CAM**	[sound of tone consistent with altitude alert]		
15:09:39.0 **HOT-2**	looks like.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:09:39.3 **CAM**	[sound of triple chime consistent with master warning]		
15:09:41.0 **HOT-2**	* the #.		
15:09:41.5 **HOT-1**	it's over temp.		
15:09:42.7 **HOT-2**	say again.		
15:09:43.6 **HOT-1**	over temp.		
15:09:45.2 **HOT-2**	over temp.		
15:09:47.3 **HOT-2**	# all right.		
15:09:51.1 **HOT-2**	all right.		
15:09:51.7 **HOT-1**	[sounds of breathing]		
15:09:53.3 **HOT-2**	uh no engines huh?		
15:09:56.6 **HOT-2**	okay we're gonna have to land.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:09:57.4 **HOT-1**	(declare/run) an emergency. [louder voice]		
15:09:58.8 **HOT-2**	I am.		
		15:09:59.9 **RDO-2**	okay uh Challenger uh uh Hopajet eight two three…
15:10:02.2 **HOT-1**	lost both engines.		
		15:10:03.1 **RDO-2**	…lost both engines. emergency… (I'm/um) making an emergency landing.
15:10:06.8 **HOT-2**	there's some water right there.		
15:10:07.7 **CAM**	[sound of tone consistent with altitude alert]		
15:10:09.1 **HOT-2**	there's water right there.		
		15:10:10.3 **TWR**	[ATC comment unintelligible due to overlapping conversation] * emergency clear to land runway two three is that Hopajet eight twenty three?
		15:10:12.3 **RDO-2**	eh we're clear to land but we're not gonna make the runway uh we've lost both engines.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:10:13.7 **CAM-3**	should I prepare the cabin? should I prepare the cabin?		
15:10:15.7 **HOT-1**	brace for impact.		
15:10:17.4 **HOT-2**	okay hey let me take over land in this water.		
15:10:20.4 **HOT-1**	negative I'm landing right here.		
15:10:21.0 **CAM**	[sound consistent with stick shaker]		
15:10:21.9 **HOT-2**	where?		
15:10:22.7 **HOT-1**	straight ahead on r– the # runway.		
15:10:24.4 **HOT-2**	what– we're not gonna make the runway.		
15:10:24.8 **CAM**	[sound of rattle similar to (jump) seat adjustment]		
15:10:25.2 **CAM**	[sound of latch/switch]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:10:26.3 **EGPWS**	sink rate. [electronic voice]		
15:10:26.6 **HOT-2**	[sounds of heavy breathing]		
15:10:27.0 **HOT-1**	not the runway the # run–		
15:10:27.8 **EGPWS**	five hundred. [electronic voice]		
15:10:28.4 **HOT-2**	no.		
15:10:29.1 **EGPWS**	sink rate. [electronic voice]		
15:10:29.2 **HOT-2**	no the road's got traffic man.		
15:10:30.0 **HOT-1**	[sounds consistent with heavy breathing]		
15:10:31.5 **HOT-2**	It's too late for the–		
15:10:32.9 **HOT-2**	ah # okay Lord.		
15:10:34.3 **EGPWS**	too low terrain. [electronic voice]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:10:35.4 **HOT-2**	land in the grass.		
15:10:36.3 **EGPWS**	sink rate. [electronic voice]		
		15:10:37.2 **TWR-?**	[unintelligible radio transmission]
15:10:37.7 **EGPWS**	sink– terrain terrain. [electronic voice]		
15:10:38.0 **HOT-2**	a hundred and ten knots.		
15:10:39.6 **EGPWS**	pull up. [electronic voice]		
15:10:39.6 **CAM**	[sound consistent with stick shaker]		
15:10:40.5 **HOT-2**	this # airplane.		
15:10:41.3 **EGPWS**	pull up. [electronic voice]		
15:10:42.1 **CAM**	[sound consistent with stick shaker]		
15:10:42.1 **HOT-2**	land in the grass.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:10:42.8 **CAM**	[sound of clacking consistent with continuous stick shaker]		
15:10:43.0 **EGPWS**	pull up. [electronic voice]		
15:10:43.4 **CAM**	[sound of clacking consistent with continuous stick shaker]		
15:10:43.9 **CAM**	[sound consistent with stall warbler/stick pusher]		
15:10:44.3 **CAM-3**	brace brace brace brace brace bra–		
15:10:44.4 **EGPWS**	pull up. [electronic voice]		
15:10:44.4 **HOT-2**	all right.		
15:10:45.9 **CAM**	[sounds consistent with touchdown]		
15:10:46.0 **CAM**	[sounds consistent with impact]		
15:10:46.1 **EGPWS**	pull up. [electronic voice]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
15:10:46.5 **HOT-2**	ah all right *		
15:10:47.6 **EGPWS**	pull up. [electronic voice]		
15:10:49.1 **END OF TRANSCRIPT** **END OF RECORDING**			