

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



GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

ERA22LA120

**By
Sean Payne**

WARNING

The reader of this report is cautioned that the transcript 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 incident 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 Recorder Division

September 6, 2023

Cockpit Voice Recorder

Group Chairman's Factual Report By Sean Payne

1. EVENT SUMMARY

Location: Beaufort, NC
Date: February 13, 2022
Aircraft: Pilatus PC-12/47E, N79NX
Operator: Private
NTSB Number: ERA22LA120

2. GROUP

A group was convened on April 25, 2022, at the NTSB's Vehicle Recorder Division laboratory in Washington, D.C. The group consisted of the following individuals:

Chairman: Sean Payne
Branch Chief – Vehicle Recorder Division
National Transportation Safety Board (NTSB)

Member: Kyle Garner
Aerospace Engineer / Investigator
NTSB

Member: Heidi Kemner
Investigator-In-Charge (IIC)
NTSB

Member: Patrick Lusch
Sr. Air Accident Investigator
Federal Aviation Administration (FAA)

Member: Martin Mendel
Factory Test Pilot
Pilatus Aircraft LTD.

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model:	L3 Lightweight Data Recorder (LDR)
Model Number:	1000-1000-00
Recorder Serial Number:	001202214

3.1 CVR Carriage Requirements

The incident aircraft, N79NX, was not required by regulation to carry a cockpit voice recorder (CVR) or flight data recorder (FDR).

3.2 Recorder Description

This recorder, the L-3 Harris Technologies LDR, is capable of recording flight data and cockpit audio using solid-state flash memory as the recording medium. The LDR records, at a minimum, 120 minutes of digital audio stored on solid state memory modules. The audio is recorded and stored in 10-minute segments. Two channels are recorded: one channel for the pilot and front seat passenger combined, and one channel for the cockpit area microphone (CAM).

3.3 Recorder Damage

The recorder was submerged in sea water and was recovered by salvagers approximately two weeks after the incident. The recorder was shipped to the NTSB Vehicle Recorder Laboratory in fresh water where it was inspected and disassembled. Figure 1 is a photo of the LDR as received by the lab.



Figure 1. The arrival condition of the L3 LDR from N79NX.

The recorder was disassembled and its internal contents were inspected. Figure 2 is a photograph of the LDR after its case having been opened. Figure 2 shows the two main internal components of the LDR. On the left is the silver metal chamber holding the memory module. The memory module area appeared relatively undamaged. On the right of figure 2 is the LDR's associated main circuit board. The circuit board, including the area where the memory module's ribbon cable attaches to the board, appeared to have encountered impact damage.



Figure 2. The internal condition of the LDR.

Figure 3 is a detailed photograph of the memory module's ribbon cable in the area where it attaches to the LDR's circuit board.



Figure 3. A close up of the memory module's ribbon cable.

The silver metal protective housing around the memory module was opened and the internal memory module was removed. Figure 4 is the internal memory module upon removal.



Figure 4. The internal memory module upon removal from the LDR.

The internal memory module was removed from the secondary protective housing, cleaned and was dried in a vacuum drying oven. A microscope inspection revealed that some of the chips' pins that are associated with voltage supply to the memory contained evidence of corrosion. One pin specifically, pin 25, contained substantial corrosion that eroded the solder connection from the chip to the board entirely. The datasheet for this chip revealed that pin 25 was labeled as "DNU/Vss." The datasheet continued to specify that pin 25 was not used, but could be used in other applications to supply power to the chip. The pad associated with pin 25 contained no traces to other components on the

memory module board, therefore was determined to have been unused in this application. Due to the evidence of corrosion to pin 25 and its associated pad, the recorder may have remained powered when submerged. Power reaching the recorder, likely from a capacitor inside the LDR, may have caused voltage to be supplied to the internal memory chips. In this scenario, power to pin 25 on the chip could have constituted one electrode, while seawater submersion could have constituted a second electrode. This could have created a scenario where corrosion from current flow between pin 25 and its associated pad could have been accelerated by seawater immersion. Figure 5 is a stereoscopic photograph of the affected area of pin 25. An arrow points to the affected area.

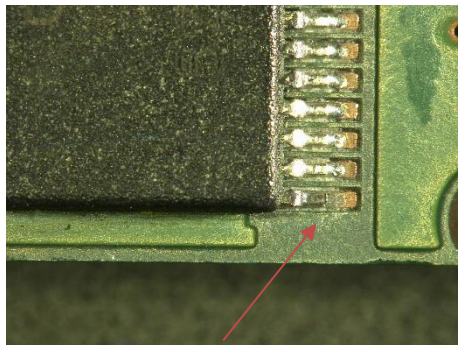


Figure 5. Damage to pin 25 on one of the device's two TSOP-48 NVM chips. An arrow points to the affected area.

Similar, but less extensive corrosive damage was noted to pins 12, 13, 34, 38, 39, and 48. All of these pins were identified as being voltage sources to power the memory chips. The corroded areas of solder were repaired at these pins.

Next, a USB cable was modified to interface the recorder with a PC. The manufacturer's read out instructions call for some versions of the LDR's internal memory device to be write protected using a jumper prior to reading the device via USB on a PC. When write protected, a PC was unable to read the device. It was not until the memory device was connected to a second PC without write protection that the memory device could be mounted and accessed. The associated files from the memory device were copied and were attempted to be decompressed by the manufacturer's software. The initial software provided by the manufacturer was unable to successfully decompress the recovered files. In lieu of using the manufacturer's software, a laboratory software process was utilized that decompressed the files. An examination of the decompressed files identified the incident flight and data was recovered successfully.

3.4 Audio Recording Description

The data downloaded normally from the CVR and produced files consistent with the logic of a L3 LDR model 1000. Ten-minute audio segments downloaded from the recorder contained stereo audio tracks. These stereo audio track contained one channel that was associated with the aircraft's cockpit area mic (CAM) and one channel that was a mix of the pilot and front seat passenger's hot mic. The quality of both channels was excellent, meaning that virtually all of the crew conversations could be accurately and easily

understood. The channel associated with the pilot and front seat passenger's voice did contain audio clipping. The clipping was such that it did not impact the overall intelligibility of the recording. The Attachment 1 to this report, which follows the CVR transcript and summary, describes the NTSB's CVR rating scale.

Each channel's audio quality is indicated in Table 1.

Table 1. Audio Quality L3 LDR from N79NX.

Channel Number	Content/Source	Quality	Duration
1	Cockpit Area Mic (CAM)	Excellent	~2 hours
2	Pilot and Front Seat Passenger Hot Mic	Excellent	~2 hours

3.5 Timing and Correlation

Timing on the transcript was established by correlating the LDR audio recording events to common events on the LDR flight data recording. Specifically, the last three radio transmissions that the aircraft made were correlated to the radio transmit microphone key parameter from the flight data. Each of the three radio transmissions acted as an anchor point for a linear interpolation between the remaining audio data events. Once a correlation between the two recorders was established, a reference to local time was determined.

All times are referenced in eastern standard time (EST).

3.6 Description of Audio Events

In agreement with the Investigator-In-Charge, a CVR group was convened. A full transcript of the incident flight was produced. The group also reviewed three previous flights that were captured by the CVR portion of the LDR. These flights are discussed in a summary format below.

Summary of Previous Flights

Third Flight Prior to the Incident Flight

The recording was approximately 16 minutes in length and began while the incident aircraft was in flight from KMRH to 7W6. The accident pilot was flying and a male minor from the accident party was in the copilot's seat. The aircraft was operating under ATC radar services until the landing segment, at which time the pilot contacted approach, reported the field in sight visually, and asked to cancel ATC service. It was unclear if the aircraft was on an IFR flight plan or had VFR flight following.

At the start of the recording, the accident pilot had a bout of coughing.

Much of the recording consisted of the accident pilot explaining the aircraft's systems and operations to the minor passenger. During the landing portion of the recording, the accident pilot's statements were consistent with instructing the minor passenger to follow along with his actions on the aircraft's flight controls.

At one point in the recording, the accident pilot was discussing the auto flight system to the minor passenger and the accident pilot stated the phrase, ***“if it works like it’s suppose to.”*** The accident pilot made comments suggesting that he had often mis-selected various different auto flight modes.

During the approach portion of the flight, the accident pilot disengaged the autopilot and made comments consistent with hand flying the aircraft to control the aircraft’s airspeed on the approach segment.

Near the end of the end of the recording the accident pilot discussed with the minor about the accident party’s plan to return. He discussed how the school schedule impacted the return of the aircraft. The minor informed the incident pilot that they had school on Monday and the accident pilot stated that they must come back on Sunday.

Second Flight Prior to the Incident Flight

The recording was approximately 38 minutes long. The recording captured the flight from 7W6 to KPGV. The accident pilot was operating the aircraft single pilot. As the nature of the operation was single pilot, the majority of the recording did not contain excess comments from the accident pilot. In portions of the recording, the accident pilot was audible coughing strongly. The pilot also remarked being “hot and cold” numerous times. Most of the recording was unremarkable, however, at approximately 34:30 elapsed time into the flight, the incident pilot stated the following:

“I can’t (tell ya any other way)¹ but my back hurts. And unfortunately I ain’t getting any breaks from it. Oxycodone is the only thing that gives me a break.” Later at 36:30 elapsed, the accident pilot stated, ***“my back is in pain. Oh man.”***

Previous Flight to the Accident Flight

The recording was approximately 38 minutes in length and consisted of the accident pilot (commercially rated, non-flight instructor) and the accident student pilot² operating the aircraft from KPGV to 7W6. The accident pilot was the father of the student pilot. There were comments presented in the cadence of using a checklist during the start and shut down portions of the flight.

The audio recording indicated that the student pilot performed the takeoff from KPGV with verbal assistance from the accident pilot. Throughout the recording, the student pilot asked multiple questions about systems on the incident aircraft and the accident pilot provided informative responses to the student pilot’s queries. Though it was unclear at times who exactly was operating the aircraft, the accident pilot did discuss instructional

¹ Use of parenthesis () indicates that the group could not agree on the exact words denoted within the parenthesis.

² This is a different individual than the minor noted in the third flight prior to the accident.

topics with the student pilot such as use of the aircraft's systems, use of the aircraft's autopilot system, descent planning profiles and landing technique, among other topics.

At 14:25 elapsed time, the student pilot commented, ***“we’re in the soup.”*** The student pilot then remarked, ***“we’re not talkin to him are we?”*** The accident pilot stated, ***“naw I’m gunna—”*** and he made no further remarks on the topic. The student pilot then commented, ***“we’re not in the soup anymore,”*** and the accident pilot laughed. After the aircraft landed at 7W6, the accident pilot remarked, ***“arlight so what I’m gunna do because it uhh what I am is am what I am going to is I’m going to file.”***

There was nothing else remarkable noted from the recording.

A full transcript of the accident flight recording follows on the next page.

Transcript of a L3 LDR solid-state combination recorder, installed on a Pilatus PC-12/47E (N79NX), which crashed in Beaufort, North Carolina on February 13, 2022.

LEGEND

APP	Radio transmission from approach controller
CAM	Sound/voice detected from the cockpit area microphone
CAS	Sound source from the crew alerting system
HOT	Sound/voice detected from the hot microphone channel
MWF	Sound source from the Honeywell Apex Monitor Warning Function
RDO	Transmission over VHF radio
TAWS	Sound source from Terrain awareness System
-1	Voice identified as the pilot
-2	Voice identified as the student pilot passenger
-?	Voice unidentified
-A	First identified facility controller
-B	Second identified facility controller
-C	Third 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 incident 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
1823:24.4			
	START OF RECORDING		
	START OF TRANSCRIPT		
18:23:30.3			
HOT-?	a lot better a lot more better.		
18:23:36.4			
HOT-?	[sound of sniffing]		
18:23:42.3			
HOT-?	[sound of nasally rough breathing congested exhale.]		
18:24:22.2			
HOT-?	[sound of passengers' voices embarking the aircraft.]		
18:24:40.1			
HOT-2	(** go over there) — we're already there.		
18:25:01.4			
HOT-?	you've never flown in any plane ever?		
18:25:09.6			
HOT-?	I reckon that if you're gunna get to fly on one that this is pretty darn— pretty darn sweet.		
18:25:20.4			
HOT-?	I can't put my legs up because it will (break the) table legs		
18:25:23.7			
HOT-1	cross.		
18:25:27.4			
HOT-1	#. [spoken under breath]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:25:29.3 HOT-?	[unintelligible passenger voices.]		
18:25:40.8 HOT-1	[sound of sigh.]		
18:25:41.0 HOT-2	what altitude you wanna be at?		
18:25:42.2 HOT-1	[cough cough] let's get thirty-five hundred feet.		
18:25:47.8 HOT-?	[sound of sniffing.]		
18:25:56.0 HOT-?	I messed up. [spoken under breath]		
18:26:01.7 HOT-?	we need like uh— instead of oxygen masks coming down— a deck of poker cards.		
18:26:10.2 HOT-?	I wanna be able to play umm Texas hold'em on these tables.		
18:26:17.6 HOT-?	(six)		
18:26:18.7 HOT-2	eight.		
18:26:20.5 HOT-2	where we at?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:26:20.8 HOT-2	eight.		
18:26:22.4 HOT-1	and then we're talkin' passengers now.		
18:26:25.4 HOT-2	cargo two hundred?		
18:26:26.7 HOT-1	yeah.		
18:26:29.0 HOT-2	fifteen hundred?		
18:26:30.6 HOT-2	err?		
18:26:31.1 HOT-1	yeah fifteen hundred.		
18:26:38.1 HOT-?	* * *(fuel) * * *.		
18:26:46.7 HOT-?	[sound of chuckling.]		
18:26:54.9 HOT	[sound of switch activation, potentially overhead panel.]		
18:26:58.2 HOT-?	(taxi)		
18:27:03.4 HOT-?	[sound of snuffle.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:27:05.5 HOT-1	can you uhhh put in uhh whiskey ninety-five?		
18:27:09.2 HOT-2	ummhmm– where? on the flight plan?		
18:27:12.0 HOT-1	yeah.		
18:27:13.2 HOT-2	not– ohh uhh did I do? * * (dang).		
18:27:17.2 HOT-2	(sorry).		
18:27:18.5 HOT-1	we'll get it later.		
18:27:20.4 HOT-2	insert seven whiskey six – K-M-R-H insert activate yeah yeah yeah.		
18:27:29.8 HOT-1	[sound of exasperated exhale.]		
18:27:33.2 HOT-1	alright. [sound of six coughs.]		
18:27:39.5 HOT-1	E-P-S– battery one battery two comin' up.		
18:27:47.7 HOT-1	we're gunna takeoff on two nine come to charlie cross the runway so we should be good.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:27:54.0 HOT-2	umm		
18:27:55.3 HOT-1	alright strobes.		
18:27:58.3 HOT-1	that's gunna be on my (nerves).		
18:28:03.6 HOT-?	* * *.		
18:28:08.9 HOT	[sound of three switch activations.]		
18:28:16.2 HOT-2	I think we're good.		
18:28:16.7 HOT	[sound of single switch activation.]		
18:28:18.2 HOT-1	alright.		
18:28:18.6 HOT-?	* * *.		
18:28:19.7 HOT-2	okay.		
18:28:22.0 HOT-?	[sound of snuffle.]		
18:28:23.5 HOT	[sound of single switch activation.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:28:25.9 HOT-2	let's just follow the dang coast.		
18:28:28.1 HOT-1	one sixty-one that's pretty darn— we're gunna do (the) thirty-one uh say thirty-five— alright.		
18:28:41.9 HOT-2	you want the probes on?		
18:28:43.5 HOT-1	not yet.		
18:28:45.0 HOT-1	clear prop. [shouted.]		
18:28:47.2 HOT	[sound of starter activating, and turbine spool up.]		
18:28:50.9 HOT	[sound of ignition process and ignitors bleeding through to the audio channel.]		
18:28:53.2 HOT	[sound of single switch activation.]		
18:29:02.9 HOT-?	[sound of snuffle.]		
18:29:13.3 CAS	[sound of master caution tone, continued for about three and a half minutes, unabated.]		
18:29:22.1 HOT	[sound of co-pilot's avionics becoming active.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:29:29.3 HOT	[sound similar to adjusting boom mic on headset.]		
18:30:05.1 HOT-1	(where on my) headrest		
18:30:08.2 HOT-2	they should be hung up back there they fall down?		
18:30:15.3 HOT-1	**		
18:30:16.5 HOT-2	I'll steer it.		
		18:30:26.8 RDO-2	Hyde County traffic Pilatus seven nine november xray is back taxiing uh runway zero eight.
18:30:35.0 HOT-1	#.		
18:30:36.0 HOT-2	I got it. I got the plane.		
18:30:37.4 HOT-1	*		
18:30:39.2 HOT-2	here— I got it I'm steering.		
18:30:50.3 HOT-1	you got it?		
18:30:51.4 HOT-2	yeah— I'm— I'm drivin'.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:30:59.7 HOT-?	*		
18:31:00.3 HOT-2	I got it.		
18:31:26.5 HOT-2	here you go— there— here they are.		
18:31:32.0 HOT-1	I can't even (get it up).		
18:31:55.5 HOT-1	I dunno what's goin' on with that.		
18:31:58.2 HOT	[sound of single switch throw.]		
18:32:00.4 HOT-1	all of 'em off— it shouldn't be beepin'.		
18:32:08.7 HOT-1	it ain't that.		
18:32:11.6 HOT-1	#.		
		18:32:15.3 RDO-1	Hyde County Pilatus * * —
18:32:16.5 HOT-2	maybe it's the pusher shaker * ? we got a pusher shaker?		
		18:32:19.1 RDO-1	—back taxi runway two nine.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:32:22.0 HOT-1	[sound of long exhale.] #. [spoken under breath.]		
18:32:25.9 HOT-1	(off).		
18:32:27.1 HOT-2	if we push this up a little bit more—		
18:32:29.1 HOT-1	* —		
18:32:29.4 HOT-2	—sorry sorry.		
18:32:31.2 HOT-2	* * now we can push our shaker.		
18:32:34.5 HOT-1	let me try it.		
18:32:36.0 CAM	[sound similar to engine power increase, then decrease.]		
18:32:40.9 CAS	[master caution sound temporarily ends.]		
18:32:43.0 HOT-?	uhhh.		
18:32:44.9 HOT-1	uhhh #.		
18:32:45.9 HOT-2	we got it I cut it off.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:32:47.2 HOT-1	aww. [exhale.]		
18:32:48.9 HOT-?	[sound of strained exhale.]		
18:32:51.4 HOT-1	awww. [long strained exhale.]		
18:33:00.9 HOT-1	ahhh. [sound of sigh.]		
18:33:03.6 HOT-1	ahhh. [sound of sigh.]		
18:33:05.9 HOT-1	we can cut this back down. to maybe fifteen— eight— sixteen somewhere in there.		
18:33:13.3 HOT-?	[sound of heavy exhale.]		
18:33:15.8 HOT-1	ouuuch.		
18:33:20.5 HOT-?	[sound of sigh.]		
18:33:25.0 HOT-2	nice tight little turn radius this thing's got.		
18:33:27.2 HOT-1	it does.		
18:33:29.3 HOT-1	it does. [repeated.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:33:30.7 HOT-2	are you— are you on the brake?		
18:33:32.7 HOT-1	uhh.		
18:33:33.1 HOT-2	the toe brakes?		
18:33:33.5 HOT-1	yes just the toe brake just a little bit so I can get it— so I can get it arrround without ummm—		
18:33:40.8 HOT-2	gettin' stuck.		
18:33:40.9 HOT-1	all right.		
18:33:42.2 HOT-?	**.		
18:33:43.9 HOT-2	get it stuck in the mud?		
18:33:45.8 HOT-1	yeah I didn't wanna go off the runway.		
18:33:49.3 HOT-2	get a little mud on the tires like Luke Bryan.		
18:33:51.7 CAM	[sound similar to engine power increase.]		
18:33:57.6 HOT-?	[sound of strain exhale.]		

Time and Source	Intra-Aircraft Communication
18:33:59.4 HOT-1	* * *
18:34:11.9 HOT-?	[sound of heavy exhales.]
18:34:20.8 HOT-1	[sound of heavy exhale] seventy-three.
18:34:25.2 HOT-1	eightyyy-fivvvve.
18:34:26.8 HOT-2	(pull up.)
18:34:27.4 HOT-1	yup.
18:34:27.7 HOT-1	[sound of exhale.]
18:34:29.3 HOT-2	little crosswind there?
18:34:30.3 HOT-1	yup little bit of a crosswind * * gear's comin' up.
18:34:32.8 HOT-2	gear's comin' up.

Time and Source	Over-the-Air Communication
18:34:01.4 RDO-1	Hyde County unicom Pilatus seven nine november xray is taking the active runway two nine be a straight out departure to the east.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:34:34.2 HOT-2	flaps comin' up.		
18:34:36.5 HOT-2	you want inert sep open?		
18:34:38.2 HOT-1	yeah for right now.		
18:34:39.4 HOT-2	uhh ***.		
18:34:40.5 HOT-2	* (track) autopilot yaw dampener speed at one thirty.		
18:34:44.6 HOT-1	yup.		
18:34:45.4 HOT-2	and we can bug our heading.		
18:34:48.4 HOT-2	and do heading.		
18:34:51.4 HOT-2	now I'll go to speed here in just a second oh uhhh I forgot it a little I jumped the gun a little.		
18:34:56.6 HOT-1	we've got two of 'em.		
18:34:58.4 HOT-1	[sound of loud coughing.]		
18:34:59.6 HOT-2	there we go.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:35:00.1 HOT-1	there it ummm—		
18:35:02.6 HOT-1	put whiskey ninety-five in there or whatever we need to do to get it in there.		
18:35:08.0 HOT-2	alright we're goin' uh-hh.		
18:35:10.9 HOT-2	moo- Morehead seven whiskey six.		
18:35:15.3 HOT-1	yup.		
18:35:15.5 HOT-2	invert— insert.		
18:35:18.6 HOT-2	activate.		
18:35:21.2 HOT-1	ahhh #.		
18:35:22.1 HOT-2	d— direct to— activate.		
18:35:24.6 HOT-1	yup.		
18:35:25.3 HOT-2	and do we navigate or will that take us through the restricted area?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:35:29.0 HOT-1	nope it'll it'll should take us uhh—		
18:35:30.7 HOT-2	do we need to insert LAVTE and all that mess?		
18:35:34.1 HOT-1	yes.		
18:35:34.7 HOT-2	insert.		
18:35:36.3 HOT-2	uhh direct to.		
18:35:37.7 HOT-2	no no no cancel.		
18:35:40.2 HOT-2	amend.		
18:35:41.3 HOT-1	ahhh. [spoken with long exhale.]		
18:35:41.9 HOT-2	uhh I need to hit the first one and then amend.		
18:35:45.2 HOT-2	will it let me amend in between?		
18:35:46.9 HOT-1	I don't know		
18:35:48.8 HOT-1	I think it it wants to get janky— with uhhh.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:35:56.0 HOT-1	I think we wanna get janky.		
18:35:57.1 HOT-2	let's do secondary— origin and then we'll do this seven whiskey six.		
18:36:02.3 MWF	[sound of altitude alerter.]		
18:36:02.8 HOT-2	seven whiskey six M-R-H insert and then before we activate— let's do intercept— no seven whiskey six amend route.		
18:36:12.0 HOT-2	yeah.		
18:36:12.4 HOT-2	(it don't).		
18:36:12.9 HOT-1	we want we want whiskey ninety-five that's what we want.		
18:36:16.7 HOT-2	whiskey ninety-five.		
18:36:17.7 HOT-1	yup.		
18:36:19.3 HOT-2	W-nine-five.		
18:36:23.1 HOT-1	activate.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:36:23.4 HOT-2	and then LAVTE?		
18:36:25.8 HOT-1	yeah.		
18:36:28.4 HOT-2	enter.		
18:36:30.1 HOT-2	activate.		
18:36:32.1 HOT-?	uhhh.		
18:36:34.6 HOT-1	(crazy/hazy).		
18:36:35.3 HOT-2	thirty-five hundred— enter.		
18:36:38.8 HOT-2	fuel— fifteen hundred.		
18:36:42.9 HOT-2	passengers eight one seventy cargo two hundred— whoop delete— enter.		
18:36:50.9 HOT-2	computing.		
18:36:56.5 HOT-?	[sound of exhale.]		
18:37:01.8 HOT-2	now flight plannnn and uhhh.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:37:10.4 HOT-2	whiskey ninety-five.		
18:37:21.3 HOT-1	we're not even— this this thing ain't even picking it up.		
18:37:26.0 HOT-1	it's not even in there.		
18:37:40.1 HOT-2	oh here we go we're good.		
		18:37:41.5 RDO-1	Cherry Point approach Pilatus seven nine november xray we're off— with you off of uh Hyde County at thirty-five hundred feet. we'll level at thirty-five uhh enroute to uhh we're enroute to whisky ninety-five and then LAVTE and then to M-R-H. just like flight following if able.
18:37:41.9 HOT-2	(whiskey ninety-five).		
		18:38:07.6 APP-1	november seven nine november xray squawk four five one six.
		18:38:12.3 RDO-1	four five one six nine novemeber xray roger.
18:38:24.7 HOT-2	sorry I don't wanna mess you up.		
18:38:26.3 HOT-2	four five one six.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:38:27.0 HOT-1	yeah yeah that ain't right.		
18:38:29.4 HOT-2	ummm.		
18:38:43.4 HOT-2	I got a secondary here but I don't know how to activate it.		
		18:38:46.3 APP-1	november xray radar contact ten miles southwest Hyde County altitude indicates three thousand four hundred and R fifty-three zero six alpha is active maintain—
		18:38:54.7 RDO-1	alright we'll remain clear we'll be to uh the east of it.
18:38:58.5 HOT-1	this is— I don't know what I need to do. just I almost wanna take it all out and start from scratch.		
18:39:05.0 HOT-2	well I don't know how to do that.		
18:39:07.2 HOT-2	this is active— I don't know how to clear it.		
18:39:07.6 HOT-1	uh.		
18:39:10.9 HOT-1	let's see— let's see somethin' here.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:39:21.1 HOT-2	I set it up on the secondary but i don't remember how to activate the secondary.		
18:39:24.0 HOT-1	ohh okay.		
18:39:25.5 HOT-2	yeah I don't know how to clear the active either.		
18:39:31.1 HOT-2	oh wait try hittin' this thing.		
		18:39:33.4 APP-1	november nine november xray to change to my frequency one one nine point seven five.
		18:39:37.6 RDO-1	nineteen seventy-five for nine november xray roger.
18:39:45.6 HOT-?	[sound of loud exhale.]		
		18:40:02.7 RDO-1	good afternoon uhh Cherry Point approach Pilatus seven nine november xray we're with you uhoh should be—
18:40:11.4 HOT-1	#— I'll tell you what we are going to have to navigate that's what we're gunna need to do— just— heading— we need to get over there 'cuz we're gunna be on the—		
18:40:26.3 MWF	[sound of altitude alerter.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:40:28.8 HOT-2	restricted area?		
18:40:29.9 HOT-1	yeah we're gonna be in the frickin' restricted area and I can't get— they gunna say you need to get outta here.		
18:40:34.8 HOT-2	they will.		
18:40:35.7 HOT-1	that's— aggravatin'.		
18:40:36.2 HOT-2	are we goin' right? or left?		
18:40:37.4 HOT-1	no we're goin' fricken left.		
18:40:41.3 HOT-1	dang it.		
18:40:54.2 HOT-1	#.		
18:41:00.0 HOT-1	#— this is ahhh [shouted] this is the—		
18:41:12.3 HOT-1	I need to get— even over here— south— I'm gunna be in the dag gone restricted area— pretty darn quick.		
18:41:22.0 HOT-2	yeah we gotta cut hard— you're cuttin' straight now.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:41:24.4 HOT-1	huh?		
18:41:25.6 HOT-2	just straighten it up— look— you're goin'— (we're/where).		
18:41:27.8 HOT-1	um hm.		
18:41:29.2 HOT-2	ain't good we're cuttin' harder.		
18:41:31.4 HOT-1	# what in the fu—		
18:41:33.0 HOT-2	we need to go east.		
18:41:34.0 HOT-1	I know.		
18:41:34.8 HOT-2	or northeast.		
18:41:38.5 HOT-1	#.		
18:41:40.4 HOT-2	or a U turn or somethin'.		
18:41:42.0 HOT-1	uh yeahhh #. [exclaimed.]		
18:41:44.4 HOT-1	#.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:41:46.0 HOT-1	#.		
18:41:49.0 HOT-1	well we gunna need to do something here.		
18:41:54.8 HOT-1	#.		
18:41:56.7 HOT-2	we're we're—		
18:41:57.4 HOT-1	I don't know # I cant (find).		
18:41:58.8 HOT-2	here just put it on northeast here let me.		
18:42:01.9 HOT-2	put it on north— where - where are we.		
18:42:04.5 HOT-1	we're right there.		
18:42:05.7 HOT-2	northwest northeast and we'll leave it— that's one eighty we're in it.		
18:42:11.7 HOT-1	and we're in it yeah # it.		
18:42:16.1 HOT-?	[sound of long dejected sigh.]		
18:42:18.0 HOT-1	whhhat in the # am I doin'?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:42:22.9 HOT-2	no we're on nav we're on nav that's why it ain't doin' – there.		
18:42:25.3 HOT-1	ahh heading.		
18:42:27.7 HOT-1	#.		
18:42:28.3 HOT-2	I don't know the quickest way out		
18:42:29.9 HOT-1	I don't know either.		
18:42:32.0 HOT-1	#.		
18:42:33.1 HOT-2	maybe climb? can we climb higher?		
18:42:35.1 HOT-1	no it doesn't matter its all—		
18:42:40.9 HOT-2	we turnin' we're turnin' out of it now.		
18:42:44.9 HOT-1	yeah now we got our east.		
18:42:47.2 HOT-1	#.		
18:42:54.1 HOT-?	thirty-five [spoken under breath]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:42:56.2 HOT-2	maybe northeast to get to this * go out here?		
18:43:00.9 MWF	[sound of altitude alerter]		
18:43:01.5 HOT-1	that's what I'm doin'.		
18:43:06.3 HOT-2	you want to cut it further north to come up here?		
18:43:08.8 HOT-1	yeah probably so it's comin' around.		
18:43:25.5 HOT-1	#. [spoken under breath]		
18:43:34.1 HOT-1	fortunately they probably can't pick us up.		
18:43:38.5 HOT-1	(cool/go) three thousand feet.		
18:43:41.0 HOT-1	#. [spoken under breath.]		
18:43:42.0 CAS	speed. [CAS Audio Voice Alert.]		
18:43:42.9 HOT-1	#.		
18:43:44.0 CAM	[sound similar to reduction in engine power.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:43:44.3 HOT-1	#. #.		
18:43:44.7 CAS	speed. [CAS Audio Voice Alert.]		
18:43:47.6 HOT-1	#.		
18:44:10.4 HOT-1	nowww- let's see if we can't—		
18:44:13.7 HOT-2	let's just hand fly the thing to—		
18:44:15.5 HOT-1	yeah but—		
18:44:16.2 HOT-2	Morehead.		
18:44:16.6 HOT-1	I want to— I want to have it I don't want to be in this # and not having it you know.		
18:44:29.2 HOT-1	#.		
18:44:36.5 HOT-1	well a little disoriented here on my *— [spoken under breath] #.		
18:44:58.4 HOT-1	well you need to be we need to be down— aaabout somewhere in that vicinity.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:45:09.1 HOT-1	I got to do— uhhh. [spoken in resigning tone.]		
18:45:14.6 HOT-1	activate flight plan.		
18:45:18.9 HOT-1	alright let's see.		
18:45:20.6 HOT-1	original.		
18:45:23.5 HOT-1	seven.		
18:45:26.1 HOT-1	whisky six.		
18:45:30.3 HOT-1	now whiskey ninety-five.		
18:45:34.3 HOT-1	whisky ninety-five.		
18:45:34.4 HOT-2	that's all destination.		
18:45:36.7 HOT-1	enter.		
18:45:40.3 HOT-1	now LAVTE.		
18:45:41.5 HOT-2	that's alternate.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:45:43.4 HOT-1	A-V.		
18:45:46.7 HOT-1	T-E.		
18:45:47.4 HOT-2	don't we need Morehead in here?		
18:45:49.5 HOT-1	yeah I do.		
18:45:50.8 HOT-2	and?		
18:45:51.7 HOT-2	and destination?		
18:45:54.2 HOT-1	#.		
18:45:56.3 HOT-1	destination yeah I put— that's the problem without that in there its uhh its screwin' us up its just screwin' us up		
18:46:12.4 HOT-2	nowwww whiskeyyy ninetyyy fiveee enter.		
18:46:17.0 HOT-?	[sound of sigh.]		
18:46:17.6 HOT-2	after that—		
18:46:18.8 HOT-1	I—		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:46:19.3 HOT-2	LAVTE		
18:46:21.3 HOT-1	I—		
18:46:21.4 HOT-2	LAV-TEE		
18:46:23.9 HOT-1	I—		
18:46:23.9 HOT-2	enter.		
18:46:24.5 HOT-1	I have— I have gotta get a fricken flight plan in this thing lets get uh—		
18:46:28.6 HOT-2	LAV-TE enter- aaand activate.		
18:46:36.4 HOT-2	alright we're good now.		
18:46:39.6 HOT-2	direct to.		
18:46:42.0 HOT-2	activate.		
18:46:44.1 HOT-2	and navigate.		
18:46:49.4 HOT-2	okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:46:53.3 HOT-1	now let's get the uhh ate— let's get the ATIS comin' up on uh— on Washington— I mean uhhh.		
18:47:16.5 HOT-1	alright wind's twenty at ten knots gusting to twenty knots visibility seven miles—		
18:47:29.9 HOT-1	current weather light rain sky overcast at one thousand feet. #		
18:47:36.2 HOT-1	alright.		
18:47:38.5 HOT-1	overcast at one thousand. sooo— we're gunna need to come in here— awww #.		
18:47:55.3 HOT-2	it's cool they didnt see us in the restricted area.		
18:47:57.8 HOT-1	huh?		
18:47:58.4 HOT-2	it's cool they didn't see us in the restricted area.		
18:48:00.4 HOT-1	yeah.		
18:48:02.1 HOT-1	we're gunna come in on two six.		
18:48:04.5 HOT-?	[sound of smacking lips.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:48:05.9 HOT-1	RNAV runway two six.		
18:48:08.6 HOT-1	we're gunna do hopefully vectors.		
18:48:12.4 HOT-1	insert.		
		18:48:27.1 RDO-1	Cherry Point approach Pilatus seven nine november xray any chance we can get the ummm RNAV for runway um two six into Beaufort Smith?
18:48:53.1 HOT-1	seven seven five we cant get—		
18:48:55.0 HOT-2	are we on are they on nineteen seventy-five?		
18:48:57.5 HOT-1	yeahh uh let's go—		
18:48:58.4 HOT-2	we're on we're on seven seven five— if they're on seventy-five		
18:49:01.3 HOT-1	yeah.		
18:49:02.1 HOT-1	let's try this one.		

Time and Source

Intra-Aircraft Communication

18:49:22.2
HOT-1 #.

18:49:37.1
HOT-1 #.

Time and Source

Over-the-Air Communication

18:49:05.1
RDO-1 and Cherry Point approach Pilatus seven nine november xray just wondering if we can get the uhh RNAV runway two six— into uhhh Beaufort Smith?

18:49:16.8
APP-1 nine november xray uhh not right now R fifty-three oh six alpha is active with harriers.

18:49:23.7
APP-1 have to be one or the other probably northeastern now the RNAV three or eight would probably be better.

18:49:30.9
RDO-1 alright uhh nine november xray we'll switch over to uh runway eight.

18:49:38.1
APP-1 nine november xray did you hear me talkin' to you earlier I tried callin' you about half dozen times uh you were in the restricted area.

18:49:43.8
RDO-1 no I uhh I followed— I was just on the border I was tryin' to get out and uhhh I was unable to uhh either receive your transmission I'm sorry.

18:49:55.7
APP-1 roger.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:49:57.8 HOT-2	I think they're on seventy five—		
18:49:58.9 HOT-1	#.		
18:49:59.6 HOT-2	not seventy-seven.		
18:50:01.1 HOT-1	were on thirty-two fifty seven.		
18:50:02.8 HOT-2	but we were on nineteen seven seven instead of nineteen seven five.		
18:50:05.8 HOT-1	alright so let's go back to this.		
18:50:08.9 HOT-1	(sim/set com).		
18:50:20.6 HOT-1	arrival.		
		18:50:24.2 APP-1	alright Pilatus nine november xray did you say you wanted the RNAV uh three or eight.
		18:50:29.6 RDO-1	uhh prefer eight if we could.
		18:50:32.0 APP-1	alright nine november xray you're cleared to Morehead uh fly heading two two five vectors around the special use airspace maintain three thousand.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		18:50:42.4 RDO-1	fly heading two two five and uhh just vectors around the airspace for nine november xray roger.
		18:50:51.2 APP-1	nine november xray maintain three thousand.
		18:50:53.6 RDO-1	and we'll maintain three thousand nine november xray.
18:50:57.7 HOT-1	two two fivvveee.		
18:51:05.9 HOT-1	heading— navigate to.		
18:51:09.8 HOT-2	two five?		
18:51:10.5 HOT-1	yup.		
18:51:14.2 HOT-1	alright so I've got to get my iPad out— I don't know where it is— and i need it.		
18:51:28.5 HOT-1	this is not good this is way— I'm way behind the eight ball— # I hate it— I hate it when that happens.		
18:51:41.2 HOT-1	K-M-R-H.		
18:51:45.5 HOT-1	pfeewww umm bring up if you can— bring up runway zero eight if you can.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:51:54.4 HOT-1	two twenty-five. [spoken under breath.]		
18:52:02.1 HOT-2	here I got you.		
18:52:04.5 HOT-2	there ya go.		
18:52:04.7 HOT-1	I ain't got my dag gone glasses either- there we go the lights help.		
18:52:10.5 HOT-1	ummm.		
18:52:12.8 HOT-1	eight.		
18:52:15.8 HOT-1	#.		
18:52:23.7 HOT-1	runway.		
18:52:26.0 HOT-1	procedures.		
18:52:31.2 HOT-1	*.		
18:52:33.4 HOT-1	approach.		
18:52:35.2 HOT-1	runway eight.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:52:44.1 HOT-1	alright.		
18:52:46.1 HOT-1	so—		
		18:52:47.2 APP-1	—november xray the restricted area is just now goin' cold so if you still want that RNAV two six into Morehead I can get that for ya now.
		18:52:53.8 RDO-1	okay nine november xray that'd be great— uh for runway two six we appreciate that.
		18:52:59.1 APP-1	nine november xray maintain three thousand proceed direct to Cig— expect no delay [the radio transmission was broken and the reading of CIGOR was broken as CIG—.]
		18:53:03.9 RDO-1	uh maintain— maintain three thousand direct uhhh CIGOR?
		18:53:08.4 APP-1	affirmative.
18:53:10.8 HOT-1	CIBAG.		
18:53:12.8 HOT-1	CI— [pronounced phonetically 'SEA']		
18:53:16.0 HOT-1	nevermind.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:53:17.6 HOT-1	RNAV runway six.		
18:53:20.4 HOT-1	RNAV.		
18:53:22.6 HOT-1	vectors.		
18:53:24.6 HOT-1	six—		
18:53:28.1 HOT-1	insert.		
18:53:30.5 HOT-1	activate.		
18:53:33.9 HOT-1	I want CIGOR.		
18:53:37.5 HOT-1	or CIBAG.		
18:53:38.8 HOT-2	I only see MOKEY.		
18:53:40.7 HOT-1	MOKEY I need CIGOR.		
18:53:44.0 HOT-1	#.		
18:53:45.7 HOT-1	#.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:53:47.4 HOT-1	ya know— uh— [spoken in a frustrated sighing tone]		
18:53:51.7 HOT-1	E-W-N.		
18:53:53.5 HOT-1	I don't wanna hold.		
18:53:55.5 HOT-1	uhh #.		
18:53:57.8 HOT-1	I wanna cross.		
18:54:00.0 HOT-1	show the info.		
18:54:02.4 HOT-1	#.		
18:54:04.6 HOT-1	# # #.		
18:54:07.2 HOT-1	I can't get nothin' on this thing that I want.		
18:54:11.3 HOT-1	delete waypoint.		
18:54:14.1 HOT-1	activate.		
18:54:15.5 HOT-1	* * *.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:54:19.3 HOT-1	uhh #.		
18:54:21.7 HOT-1	alright after that I want CI—		
18:54:24.2 HOT-2	uhh I think we're way— here—		
18:54:25.9 HOT-1	no let's go—		
18:54:26.4 HOT-2	no we're comin' up here do we wanna insert something form here?		
18:54:28.4 HOT-1	yeah yeah uhhh we want uhhh direct CIGOR. right there.		
18:54:33.4 HOT-1	CIBAG I'm sorry we want CIBAG.		
18:54:36.2 HOT-2	yeah I think— it didn't say CIBAG.		
18:54:36.6 HOT-1	no wait a minute wait a minute wait a minute uh uh two six— we're on two six nowww. #.		
18:54:44.7 HOT-1	#.		
18:54:46.4 HOT-2	after LAVTE do—.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:54:47.1 HOT-1	# .		
18:54:48.3 HOT-2	CIGOR S-E-G-O-R?.		
18:54:49.7 HOT-1	nooo I'm get uhh— [sound of sigh] # # # #.		
18:54:58.7 HOT-1	#.		
18:55:01.2 HOT-1	I don't want this.		
18:55:03.3 HOT-1	let me see let me see here here here cancel cancel.		
18:55:07.1 HOT-1	activate vectors.		
18:55:09.5 HOT-1	uhhh # I want to cancel.		
18:55:13.1 HOT-1	ahhh # # # #. [sound of sigh.]		
18:55:16.4 HOT-?	* * .		
18:55:18.1 HOT-1	I don't want to activate I want CIBAG.		
18:55:23.7 HOT-1	#.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:55:23.8 HOT-2	I thought he said CIGOR.		
18:55:25.2 HOT-1	uhh well we're goin' for two six now. can you get that up?		
18:55:31.4 HOT-2	two six.		
18:55:37.2 HOT-2	wooo—		
18:55:38.7 HOT-1	this is so fricken.		
18:55:44.2 HOT-1	ahhh #.		
18:55:46.4 HOT-1	Initial.		
18:55:48.5 HOT-1	activate—		
		18:55:49.0 APP-1	nine november xray verify you're direct CIGOR now.
		18:55:51.2 RDO-1	uhhh direct CIGOR now nine november xray roger.
		18:55:54.8 APP-1	seven nine november xray proceed direct CIGOR cross CIGOR at or above one thousand nine hundred cleared for the RNAV two six into Beufort Morehead.

Time and Source	Intra-Aircraft Communication
18:56:13.1 HOT-1	#.
18:56:13.4 HOT-2	should we get 'em to spell CIGOR and just insert there * *__
18:56:15.3 HOT-1	no * just off of that.
18:56:16.9 HOT-2	I don't see it on here I don't know how to find it on here.
18:56:19.3 HOT-1	#.
18:56:21.0 HOT-2	airports.
18:56:22.2 HOT-1	uhh 'kay.
18:56:22.8 HOT-2	runways. procedure. runway two six.
18:56:25.2 HOT-1	#####.
18:56:33.1 HOT-1	MOKEY.

Time and Source	Over-the-Air Communication
18:56:03.3 RDO-1	uh we're down to one thousand nine hundred cross CIGOR at above nineteen hundred cleared for the uhh runway two six.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:56:34.6 HOT-1	let's go uhhh lets see.		
18:56:35.1 MWF	[sound of altitude alerter.]		
18:56:36.8 HOT-1	spell CIGOR for me.		
18:56:38.3 HOT-2	I don't know how to spell it.		
18:56:39.3 HOT-1	it sayin' it on that thing?		
18:56:40.4 HOT-2	I don't see it on here.		
18:56:43.2 HOT-1	uhhh #.		
18:56:45.2 HOT-1	#. procedures.		
18:56:49.2 CAM	[sound of aircraft engine power decreasing]		
18:56:50.1 HOT-1	ohhh. #.		
18:56:52.7 HOT-1	two six.		
18:56:56.4 HOT-1	get ummm— there is— there's CIGOR. CIGORs somewhere in there. there's CIGOR. C-I—		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:57:04.4 HOT-2	G-O-R.		
18:57:05.8 HOT-2	insert direct to CIGOR?		
18:57:07.2 HOT-1	yeah		
18:57:18.0 HOT-2	enter— amend—		
18:57:19.6 HOT-1	yeah.		
18:57:20.4 HOT-2	C— delete— I-G...		
18:57:26.7 HOT-2	...O...		
18:57:26.8 HOT-2	...R. enter.		
18:57:29.0 HOT-1	activate.		
18:57:29.3 HOT-2	now activate.		
18:57:29.9 HOT-1	yep. [sound of sigh.]		
18:57:31.6 HOT-2	and he said at or above what?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:57:33.1 HOT-1	nineteen hundred.		
18:57:37.4 HOT-1	alright.		
18:57:38.0 HOT-2	direct to.		
18:57:39.4 HOT-1	activate. I think we're there.		
18:57:41.3 HOT-2	wooo.		
18:57:42.7 HOT-1	CIGOR.		
18:57:44.4 HOT-1	direct to. navigate.		
18:57:51.5 HOT-1	alright uh passin' CIGOR what is our uhhh— [cutoff by approach.]		
		18:57:55.2 APP-1	Pilatus nine november.
18:57:58.7 HOT-1	ahhh.		
		18:58:01.5 RDO-1	nine november xray go ahead.
18:58:08.3 HOT-1	#.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		18:58:10.1 RDO-1	and uhhh nine november xray go ahead.
		18:58:15.6 APP-1	nine november xray it looks like you were heading southwest I was just asking if you needed an initial steer an initial heading toward CIGOR but it looks like you're correcting now.
		18:58:24.5 RDO-1	uhhh that's affirmative for nine november xray. thank you though.
18:58:32.8 HOT-1	alright past past CIGOR— alright CIGOR is— um MOKEY is the next one and that'll be a thousand feet but we're not gunna do— what we'll do—		
		18:58:47.2 APP-1	nine november xray cherry point altimeter's two niner niner six uhh check your altitude I'm showing you at one thousand seven hundred maintain one thousand nine hundred until CIGOR.
		18:58:56.4 RDO-1	okay two nine nine six for uh nine november xray— nine november xray roger.
18:59:10.1 HOT-?	[sound of sigh.]		
18:59:12.4 CAS	stall.		
18:59:13.1 HOT-1	# #.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:59:13.2 CAM	[sound similar to engine power increase.]		
18:59:13.7 MWF	stall.		
18:59:14.4 HOT-1	#.		
18:59:15.5 MWF	[sound of autopilot disconnect warning.]		
18:59:16.2 HOT-1	#.		
18:59:16.8 MWF	[sound of autopilot disconnect warning.]		
18:59:17.7 HOT-1	#.		
18:59:18.2 MWF	[sound of autopilot disconnect warning.]		
18:59:19.3 HOT-1	#.		
18:59:19.6 MWF	[sound of autopilot disconnect warning.]		
18:59:21.0 MWF	[sound of autopilot disconnect warning.]		
18:59:21.6 HOT-1	#. heading.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:59:22.2 MWF	[sound of autopilot disconnect warning.]		
18:59:23.0 HOT-1	#.		
18:59:23.7 MWF	[sound of autopilot disconnect warning.]		
18:59:24.3 HOT-1	# it # it # it # it.		
18:59:24.9 MWF	[sound of autopilot disconnect warning.]		
18:59:26.3 MWF	[sound of autopilot disconnect warning.]		
18:59:27.6 MWF	[sound of autopilot disconnect warning.]		
18:59:28.6 HOT-1	heading. #.		
18:59:28.8 MWF	[sound of autopilot disconnect warning.]		
18:59:30.4 MWF	[sound of autopilot disconnect warning.]		
18:59:30.9 HOT-1	navigate. #		
18:59:31.6 MWF	[sound of autopilot disconnect warning.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:59:32.7 HOT-1	#.		
18:59:32.8 MWF	[sound of autopilot disconnect warning.]		
18:59:34.4 MWF	[sound of autopilot disconnect warning.]		
18:59:35.1 HOT-1	# I'm goin' down.		
18:59:35.7 MWF	[sound of autopilot disconnect warning.]		
18:59:37.1 MWF	[sound of autopilot disconnect warning.]		
18:59:37.3 HOT-1	#. [yelled].		
18:59:38.4 MWF	[sound of autopilot disconnect warning.]		
18:59:38.9 HOT-1	what is my #ing? ahhh.		
18:59:39.8 MWF	[sound of autopilot disconnect warning.]		
18:59:40.8 HOT-2	we're side- we're sideways.		
18:59:41.1 MWF	[sound of autopilot disconnect warning.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:59:42.4 MWF	[sound of autopilot disconnect warning.]		
18:59:43.3 HOT-2	look at your—		
18:59:43.6 MWF	[sound of autopilot disconnect warning]		
18:59:43.9 HOT-1	I know #.		
18:59:44.8 MWF	[sound of autopilot disconnect warning.]		
18:59:45.4 HOT-1	# # # # #.		
18:59:45.9 MWF	[sound of autopilot disconnect warning.]		
18:59:47.8 HOT-1	what are we doin' what in the fu—		
18:59:48.0 MWF	[sound of autopilot disconnect warning.]		
18:59:49.2 MWF	[sound of autopilot disconnect warning.]		
18:59:50.2 HOT-1	oh #.		
18:59:50.7 MWF	[sound of autopilot disconnect warning.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
18:59:50.7 CAM	[sound similar to engine power increasing.]		
18:59:51.9 MWF	[sound of autopilot disconnect warning.]		
18:59:53.2 MWF	[sound of autopilot disconnect warning.]		
18:59:54.0 HOT	oh # # # # #.		
18:59:54.3 CAM	[sound of stick shaker activation.]		
18:59:55.4 MWF	stall.		
18:59:57.1 MWF	[sound of autopilot disconnect warning.]		
18:59:57.5 HOT-1	# [yelled.]		
18:59:57.8 CAM	[sound of stick shaker activation.]		
18:59:58.8 HOT-1	#. [yelled.]		
18:59:59.3 MWF	stall.		
19:00:00.5 HOT-1	#. [yelled.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:00:00.7 MWF	stall.		
19:00:02.0 HOT-1	#. [yelled.]		
19:00:02.2 CAM	[sound of stick shaker activation.]		
19:00:02.7 MWF	stall.		
19:00:03.7 HOT-1	# it. [yelled.]		
19:00:04.1 MWF	stall.		
19:00:05.1 HOT-1	# it come on down. [yelled.]		
19:00:05.7 HOT	[sound of single chime of unknown source.]		
19:00:06.6 HOT-2	bring it down.		
19:00:07.2 HOT-1	ah #.		
19:00:07.6 MWF	stall.		
19:00:08.6 HOT-1	oh #.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:00:09.3 MWF	stall.		
19:00:10.4 HOT-1	ahhh #.		
19:00:11.0 HOT-2	here let's turn it turn it this way.		
19:00:11.5 MWF	stall.		
19:00:12.5 HOT-1	it's good now were—		
19:00:12.7 HOT-1	# it # it # it # it # it # it # it.		
19:00:13.5 MWF	[sound of autopilot disconnect warning.]		
19:00:14.7 MWF	[sound of autopilot disconnect warning.]		
19:00:15.6 MWF	[sound of autopilot disconnect warning.]		
19:00:16.4 MWF	[sound of autopilot disconnect warning.]		
19:00:17.5 MWF	[sound of autopilot disconnect warning.]		
19:00:18.8 MWF	[sound of autopilot disconnect warning.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:00:20.1 MWF	[sound of autopilot disconnect warning.]		
19:00:21.5 MWF	[sound of autopilot disconnect warning.]		
19:00:21.6 HOT-1	CIGOR.		
19:00:22.9 MWF	[sound of autopilot disconnect warning.]		
19:00:23.3 HOT-1	#.		
19:00:24.1 MWF	[sound of autopilot disconnect warning.]		
19:00:25.2 HOT-1	I am—		
19:00:25.6 MWF	[sound of autopilot disconnect warning.]		
19:00:26.9 MWF	[sound of autopilot disconnect warning.]		
19:00:28.3 MWF	[sound of autopilot disconnect warning.]		
19:00:29.5 HOT-1	# now let me get back down it—		
19:00:29.6 MWF	[sound of autopilot disconnect warning.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:00:30.7 MWF	[sound of autopilot disconnect warning.]		
19:00:32.3 MWF	[sound of autopilot disconnect warning.]		
19:00:32.5 HOT-1	uhh.		
19:00:33.7 MWF	[sound of autopilot disconnect warning.]		
19:00:34.3 HOT-?	[sound of heavy breathing.]		
19:00:34.9 MWF	[sound of autopilot disconnect warning.]		
19:00:36.0 MWF	[sound of autopilot disconnect warning.]		
19:00:36.0 HOT-1	heading.		
19:00:37.5 HOT-1	navigate on that— [sound of heavy breathing.]		
19:00:37.5 MWF	[sound of autopilot disconnect warning.]		
19:00:38.8 MWF	[sound of autopilot disconnect warning.]		
19:00:40.0 HOT-?	[exasperated exhale.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:00:40.3 MWF	[sound of autopilot disconnect warning.]		
19:00:41.1 HOT-1	ah # it'll navigate. [yelled] # it.		
19:00:41.9 MWF	[sound of autopilot disconnect warning.]		
19:00:43.0 MWF	[sound of autopilot disconnect warning.]		
19:00:44.4 MWF	[sound of autopilot disconnect warning.]		
19:00:45.6 HOT-1	# it #. [yelled]		
19:00:45.9 MWF	[sound of autopilot disconnect warning.]		
19:00:47.1 HOT-1	# navigate. [yelled] navigate. [screamed in frustrated tone.]		
19:00:47.1 MWF	[sound of autopilot disconnect warning.]		
19:00:48.3 MWF	[sound of autopilot disconnect warning.]		
19:00:49.7 MWF	[sound of autopilot disconnect warning.]		
19:00:49.8 HOT-1	#.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:00:51.1 MWF	[sound of autopilot disconnect warning.]		
19:00:52.1 HOT-?	[heavy breathing.]		
19:00:52.4 MWF	[sound of autopilot disconnect warning.]		
19:00:53.4 HOT-1	# #.		
19:00:53.8 MWF	[sound of autopilot disconnect warning.]		
19:00:55.1 MWF	[sound of autopilot disconnect warning.]		
19:00:55.7 HOT-1	activate vectors.		
19:00:56.4 MWF	[sound of autopilot disconnect warning.]		
19:00:57.5 HOT-1	# that's it.		
19:00:57.6 MWF	[sound of autopilot disconnect warning.]		
19:00:59.1 MWF	[sound of autopilot disconnect warning.]		
19:00:59.2 HOT-1	# # # # #.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:01:00.5 MWF	[sound of autopilot disconnect warning.]		
19:01:01.9 MWF	[sound of autopilot disconnect warning.]		
19:01:02.6 HOT-?	[sound of heavy breathing.]		
19:01:03.2 MWF	[sound of autopilot disconnect warning.]		
19:01:04.1 HOT-1	now I've got to get back over here to CIGOR.		
19:01:04.4 MWF	[sound of autopilot disconnect warning.]		
19:01:05.7 MWF	[sound of autopilot disconnect warning.]		
19:01:07.3 MWF	[sound of autopilot disconnect warning.]		
19:01:08.4 HOT-1	###.		
19:01:08.5 MWF	[sound of autopilot disconnect warning.]		
19:01:10.0 HOT-1	I'm over at twenty-seven hundred feet.		
19:01:10.0 MWF	[sound of autopilot disconnect warning.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:01:11.5 MWF	[sound of autopilot disconnect warning.]		
19:01:12.7 MWF	[sound of autopilot disconnect warning.]		
19:01:13.0 HOT-1	mother #. [yelled.]		
19:01:13.9 MWF	[sound of autopilot disconnect warning.]		
19:01:15.0 HOT-1	mother #. [yelled]		
19:01:15.2 MWF	[sound of autopilot disconnect warning..]		
19:01:16.2 HOT-1	mother # mother #. [yelled.]		
19:01:16.3 MWF	[sound of autopilot disconnect warning.]		
19:01:17.3 MWF	[sound of autopilot disconnect warning.]		
19:01:18.9 HOT-1	mother #.		
19:01:19.1 MWF	[sound of autopilot disconnect warning.]		
19:01:19.8 HOT-?	oh my God. [exclaimed.]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:01:20.6 MWF	[sound of autopilot disconnect warning.]		
19:01:20.8 HOT-1	mother #. [yelled.]		
19:01:21.6 TAWS	sink rate.		
19:01:21.8 MWF	[sound of autopilot disconnect warning.]		
19:01:22.2 HOT-2	Dad. [spoken in elevated tone.]		
19:01:23.1 TAWS	sink rate.		
19:01:23.4 MWF	[sound of autopilot disconnect warning.]		
19:01:23.7 HOT-1	mother #. [yelled.]		
19:01:24.0 HOT-?	* *.		
19:01:24.7 MWF	[sound of autopilot disconnect warning.]		
19:01:24.7 HOT-1	#. [yelled.]		
19:01:25.2 MWF	sink rate		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
19:01:25.3 HOT-2	dad. [yelled.]		
19:01:26.0 HOT-1	#. [yelled.]		
19:01:26.7 TAWS	pull up.		
19:01:26.9 MWF	speed.		
19:01:27.1 HOT-?	[sound of screaming.]		
19:01:28.2 TAWS	pull up.		
19:01:28.6 MWF	speed.		
1901:29.0 END OF TRANSCRIPT END OF RECORDING			

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.