

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



**ERRATA 1 TO GROUP CHAIRMAN'S FACTUAL REPORT OF
INVESTIGATION**

CEN19FA036

**By
Charles Cates**

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 accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the transcript as the sole source of information.

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

June 15, 2021

Cockpit Voice Recorder – Errata 1

By Charles Cates

1. ERRATA SUMMARY

Timing information from an official Air Traffic Control transcript was provided to the Cockpit Voice Recorder Group Chairman following the release of the Cockpit Voice Recorder transcript. Previously the timing information for the Cockpit Voice Recorder transcript came from an air traffic controller's verbal recitation of the current time. The official Air Traffic Control transcript had an offset of 7 seconds from the original recited time.

The following are updates to Sections 3.5, 3.6, and the attached transcript.

3.5 Timing and Correlation

Timing on the transcript was established by correlating the air traffic control recording transmission time to the corresponding CVR event. Specifically, the CVR time of the final radio transmission from N525EG was linked to the corresponding ATC transcript time, and all CVR events were offset to reflect the local eastern daylight time of the accident.

3.6 Description of Audio Events

The recording began at 0956:18 and the transcript began at 1014:47. At the start of the transcription passengers were on board and voices could be heard in the cabin on the Cockpit Area Microphone channel. Sounds similar to engine starts occurred at 1016:36 and 1017:12. The pilot donned his headset at 1017:57 and could be heard clearly in the hot mic running through aircraft checklists.

The pilot contacted Louisville approach for an IFR clearance and was released at 1022:38. The sound of increasing engine RPM for takeoff occurred about one minute 40 seconds later.

Following takeoff the pilot performed standard flight operations and contacted Louisville departure at 1025:33, reporting that the aircraft was leveling at 3,000 feet. The controller cleared the aircraft to 10,000 feet.

At 1026:19 the pilot began to recite the after-takeoff checklist. During the checklist the departure controller instructed the pilot to contact Indy center, which the pilot confirmed and then continued the checklist items.

At 1026:48 the sound of a click was recorded and an electronic voice said, "Autopilot", consistent with the autopilot disconnecting. Immediately afterward the pilot made an expression of surprise and confusion. Five seconds later a series of six GPWS automated bank angle warnings were recorded, followed by a beeping tone similar to the overspeed warning that continued until the end of the recording.

At 1027:11 the pilot made a mayday call and stated that the aircraft was in an emergency descent and he was unable to gain control of the aircraft.

The recording ended shortly thereafter at 1027:20.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
0956:18.0			
	START OF RECORDING		
	START OF TRANSCRIPT		
10:14:47.6			
CAM	[sounds of background conversation]		
10:15:36.4			
CAM	[sounds of clicks]		
10:16:08.3			
CAM	[sound similar to seatbelt buckle]		
10:16:36.3			
CAM	[sound similar to engine start]		
10:17:12.7			
CAM	[sound similar to engine start]		
10:17:43.9			
CAM	[sound of clicks]		
10:17:57.7			
HOT	[sound of beep]		
10:18:27.5			
HOT	g p u's been. hello, hello, hello?		
10:18:31.8			
HOT	side tone everything *. and just a touch		
10:18:36.2			
HOT	generators have been checked and online fadec's been pushed air source knob is on both. air conditioner.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
10:18:43.6 HOT	thats set to warm and fans are on. pressurization is set for the destination. flaps set takeoff and approach. trims have been checked.		
10:18:49.5 HOT	flight controls...		
10:18:53.1 HOT	are checked. flight instruments airspeed is readin zero. heading indicators are within two degrees. attitude indicators are spot on.		
10:19:00.2 HOT	meters are readin four sixty four sixty and four fifty.		
10:19:04.5 HOT	outta here and up to three thousand.		
10:19:08.0 HOT	have our takeoff, go around.		
10:19:11.8 HOT	f m s charts. f m s er chica er clark county * to midway off of three six.		
10:19:21.1 HOT	check the weather		
		10:19:23.2 RDO-ATIS	temperature one zero celsius dewpoint niner altimeter two niner niner niner
10:19:30.8 HOT	two nine nine nine		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		10:19:34.7 RDO-ATIS	clark county airport automated weather observation one six one niner zulu weather. wind calm visibility one zero. ceiling eight hundered overcast temperature one zero celsius dewpoint niner altimeter two niner niner niner.
10:19:36.4 HOT	charts.		
10:19:44.4 HOT	wind calm we'll still do three six.		
10:19:49.7 HOT	takeoff data. three thousand. one oh one one oh five one thirteen and one thirty two.		
10:19:58.2 HOT	annunciator panel is *.		
10:20:05.2 HOT	and passenger advisory.		
10:20:06.3 CAM	[sound of click]		
10:20:07.9 CAM	[sound similar to passenger safety chime].		
		10:20:13.0 RDO	clark county traffic citation five two five echo golf taxiing runway three six from a s i clark county.
10:20:31.9 CAM	[sound of three clicks]		
10:20:39.3 HOT	* * * * *.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
10:20:45.6 HOT	*.		
10:20:52.4 HOT	alrighty.		
10:21:13.9 CAM	[sound of click]		
10:21:14.4 HOT	oop.		
10:21:15.5 HOT	aaand lets see brakes have been checked anti ice de ice checked and not required.		
10:21:21.7 HOT	rudder bias has been tested. crew briefing this will be a rolling takeoff three six. anything below eighty knots i will abort. between eighty knots and vee one, uh one oh one abort for loss of engine, directional control, fire, or a red light. after vee one handle as an in flight emergency.		
10:21:43.6 HOT	fly the airplane, address the problem, get the autopilot on, talk on the radios, divert over to Stanford.		
10:21:49.9 HOT	on departure expect uh radar vectors to three thousand.		
		10:21:58.9 RDO	louisville clearance citation five two five echo golf number one for runway three six at clark county.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		10:22:06.4 APCH	citation five two five echo golf louisville approach i'll be right back with you on that release to midway.
		10:22:11.1 RDO	five echo golf.
10:22:11.8 HOT	[sound of two beeps]		
		10:22:38.1 APCH	citation five echo golf off runway three six at clark county you are now released. * * airspace cleared direct STREP. maintain three thousand. clearance void in five minutes. time now sixteen twenty two and three quarters.
		10:22:48.7 RDO	* we're cleared for release uh enter your controlled airspace direct STREP three thousand and void if not off in five minutes. five echo golf.
10:22:59.4 HOT	alrighty.		
10:23:03.8 HOT	alright. flaps. flaps are set fifteen indicated fuel is sufficient for the flight. we need two thou uh twelve hundred pounds got thirty three hundred.		
10:23:14.0 HOT	* * posted speeds are posted speedbrakes are checked * and trims are set in all three places.		
10:23:19.0 HOT	anti ice de ice is not required.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
10:23:22.2 HOT	we got pitot heat, strobes, landings are on.		
10:23:26.3 CAM	[sound similar to passenger safety chime].		
10:23:27.2 HOT	and transponder tee cas is on annunciator panel is ground idle only. passenger advisory. they're seated.		
		10:23:35.3 RDO	clark county traffic citation five two five echo golf departing runway three six i f r to the north. clark county.
10:24:18.7 HOT	this is three six.		
10:24:20.8 CAM	[sound similar to increasing engine rpm]		
10:24:24.9 HOT	power set.		
10:24:27.6 HOT	and made. engine instruments are in the green airspeed is alive and crosschecked.		
10:24:32.3 HOT	eighty knot check.		
10:24:36.3 HOT	vee one. rotate.		
10:24:41.3 HOT	positive rate gear up. selected.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
10:24:54.0 HOT	four hundred feet. flaps comin up.		
10:24:59.0 HOT	power is set to m c t. engine syncs on. yaw dampers on.		
10:25:06.4 HOT	gonna go nav. direct STREP. execute. vertical speed. up to three thousand.		
10:25:22.3 HOT	Altitude [electronic voice]		
10:25:22.7 HOT	lets go ahead we'll get autopilot on. and over to departure.		
		10:25:33.9 RDO	louisville departure citation five two five echo golf direct STREP leveling at three thousand.
		10:25:39.3 DEP	citation five two five echo golf louisville departure climb and maintain one zero thousand and ident. the louisville altimeter is two niner niner niner.
		10:25:45.2 RDO	two nine nine nine ident up to ten thousand five two five echo golf.
		10:25:51.0 DEP	citation five echo golf radar contact three miles north of the clark county airport.
		10:25:55.3 RDO	five echo golf.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
10:25:56.8 HOT	ten thousand set.		
10:26:02.6 HOT	we'll let - let the power do its thing.		
10:26:19.0 HOT	after takeoff checklist.		
10:26:22.7 HOT	we have landing gear is up and indicating up flaps are up and indicating up engine sync is on yaw dampener and autopilot are both on.		
		10:26:29.2 DEP	citation five echo golf contact indy center one two four point seven seven.
		10:26:32.7 RDO	two four seven seven five echo golf.
		10:26:35.1 DEP	g'day.
10:26:38.5 HOT	uhhh lets seeeee. pressurization pressurizing anti ice de ice systems are not required at this time.		
10:26:48.0 CAM	[sound of click]		
10:26:48.3 HOT	autopilot. [electronic voice]		
10:26:49.4 HOT	whoooooaaaaah .		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
10:26:54.6 GPWS	bank angle [electronic voice].		
10:26:56.4 GPWS	bank angle [electronic voice].		
10:26:58.1 GPWS	bank angle [electronic voice].		
10:26:59.8 GPWS	bank angle [electronic voice].		
10:27:01.2 GPWS	bank angle [electronic voice].		
10:27:02.9 GPWS	bank angle [electronic voice].		
10:27:04.1 HOT	[pulsing beeping tone similar to overspeed warning alert, continues until end of recording].		
10:27:06.0 HOT	#. #. #. [shouted]		
10:27:07.0 GPWS	bank angle [electronic voice].		
10:27:08.6 GPWS	bank angle [electronic voice].		
10:27:11.5 HOT	may-.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		10:27:11.9 RDO	mayday mayday mayday citation five two five echo golf is in an emergency descent unable to gain control of the aircraft. [shouted]
10:27:16.0 GPWS	terrain terrain [electronic voice].		
10:27:20.2 CAM	[sound of impact]		
		10:27:20.9	[end of recording]
10:27:21.5 END OF TRANSCRIPT END OF RECORDING			