

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



GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

**CEN13FA326
By
Bill Tuccio, Ph.D.**

WARNING

The reader of this report is cautioned that the summary of a cockpit voice recorder audio recording is not a precise science. The summary or parts thereof, if taken out of context, could be misleading. The summary 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 as the sole source of information.

NATIONAL TRANSPORTATION SAFETY BOARD
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June 30, 2014

Cockpit Voice Recorder

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

1. EVENT

Location: Baker, Louisiana
Date: June 7, 2013
Aircraft: Beechcraft B200GT, N510LD
Operator: Private
NTSB Number: CEN13FA326

2. GROUP

A group convened on May 29, 2014:

Chairman: Bill Tuccio, Ph.D.
Aerospace Engineer
National Transportation Safety Board

Member: Craig R. Hatch
Investigator-in-Charge
National Transportation Safety Board

Member: Patrick A. Hempen
Air Safety Investigator
Federal Aviation Administration

Member: Chris Harrold
Chief Test Pilot
Beechcraft Corporation

3. SUMMARY

On June 7, 2013 about 1310, central daylight time (CDT), a Beechcraft, B200GT, KingAir airplane, N510LD, impacted terrain in a residential neighborhood near Baker, Louisiana, shortly after departure. The airline transport

pilot received fatal injuries and the airplane was destroyed. The airplane was registered to Cloudscape, Inc. Wilmington, Delaware, and operated by a private individual. Visual meteorological conditions prevailed and a flight plan was not filed for the 14 *Code of Federal Regulations* Part 91 personal cross-country flight. The flight originated from Baton Rouge Metropolitan Airport, Ryan Field (KBTR), Baton Rouge, Louisiana, en route to (Pike County) John E Lewis Field Airport (KMCB), McComb, Mississippi. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout. The CVR group meeting convened on May 29, 2014 and this summary report was prepared for the entire recording.

4. DETAILS OF INVESTIGATION

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

Recorder Manufacturer/Model: **L-3/Fairchild FA2100-1010**
Recorder Serial Number: **unknown**

4.1. Recorder Description

Per federal regulation 14 CFR 91.609, aircraft manufactured prior to April 7, 2010, must be equipped with a CVR that records a minimum of the last 30 minutes of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes of CVR operation. This model CVR, the L-3/Fairchild FA2100-1010, records 30 minutes of digital audio stored in solid-state memory modules. Four channels of audio information are retained: one channel for each flight crew and one channel for the cockpit area microphone (CAM).

4.2. Recorder Damage

Upon arrival at the audio laboratory, it was evident that the CVR sustained heat and structural damage, as shown in figure 1. The crash protected memory unit was removed, and the internal memory was found intact, as shown in figure 2. The ribbon cable was repaired and the memory installed into an NTSB surrogate L-3 recorder. The recorded contents were downloaded without difficulty.

Figure 1. Damaged CVR.



Figure 2. Intact memory.



4.3. CVR Channels

The recording consisted of four channels of audio information. Two of the channels contained audio information from the captain's and first officer's audio

panels. The quality of these two channels was excellent.¹ One channel contained the cockpit area microphone (CAM) audio information. The quality of this channel was excellent. The fourth channel contained audio information from the aircraft's Public Address (PA) system. The quality of this channel was excellent.

4.4. Timing and Correlation

The recording contained two flights: a flight prior to the accident flight and the accident flight. The flight prior to the accident flight is expressed in CVR Elapsed Time (time from the beginning of the recording).

The times used for the accident flight are expressed as local time of the accident (CDT).

Timing of the accident flight was aligned with timing information provided by air traffic control (ATC). Specifically, a radio transmission made by the pilot at 0030:27.524 CVR Elapsed Time was aligned with the same transmission recorded by ATC at 1831:31.0 Coordinated Universal Time (UTC). Subtracting 5 hours from UTC to convert to CDT, resulted in the following relationship: 1310:31.0 CDT = 0030:27.524 CVR Elapsed Time.

4.5. Summary of Recording Contents

The recording began when the aircraft was inbound to the Baton Rouge airport and was communicating with Baton Rouge Approach ("Flight Prior to the Accident Flight"). The accident pilot was the flying pilot and another person was communicating on the radios, assisting with checklists, and offering advice to the flying pilot ("Assisting Pilot"). The flight prior to the accident flight lasted about 7 minutes followed by about 3 minutes of ground operations; the precise CDT time of the flight was not determined, but it was on the same day as the accident flight.

Flight Prior to the Accident Flight

The times of the flight prior to the accident flight are expressed in elapsed time from the beginning of the recording. The format is MM:SS.t, where MM is minutes, SS is seconds, and t is tenths of seconds (when applicable).

At about 01:00 elapsed time, the accident pilot commented to the assisting pilot, "sure seems like awfully low torque to get it to start slowin' down." To which the assisting pilot replied, "yeah."

At 01:15.8 elapsed time, Baton Rouge Approach offered N510LD runway 4L, advising the winds were from 280 degrees at 10 knots. The accident pilot told the assisting pilot they could take that runway; the assisting pilot did not respond to this statement. At 01:43.6 elapsed time, the accident pilot again told the assisting pilot they could take 4L. The assisting pilot responded, "alright, oh, you want me to tell him?" After the accident pilot confirmed, the assisting pilot

¹ See Attachment I for the CVR Quality Rating Scale

told Baton Rouge Approach they could take 4L. Baton Rouge Approach then began to give N510LD radar vectors for 4L.

At 01:55.3 elapsed time, Baton Rouge Approach gave N510LD a vector of 100 degrees, which the assisting pilot acknowledged. The following interaction then occurred,

02:02.6	Assisting Pilot	heading.
02:13.3	Accident Pilot	heading one hundred.
02:14.3	Assisting Pilot	yeah and don't forget to ah....if you want it back on F-M-S or do you still. cause when you leave. when you get on the ground it's gonna' go to V-oh-R so.
02:23.7	Assisting Pilot	I just go there.
02:24.0	Accident Pilot	say. wherever whatever you say. I don't know what we're doin' now.
02:27.0	Assisting Pilot	back on that.
02:30.2	Accident Pilot	how far from the airport are we? that's what I need to know.
02:33.0	Assisting Pilot	fourteen miles.

At 03:07.1 elapsed time, Baton Rouge Approach advised N510LD of traffic and the assisting pilot told Baton Rouge Approach they were looking for the traffic. The assisting pilot then told the accident pilot, "there's your line for your approach course I put in."

At 03:26.3 elapsed time, the accident pilot began this interaction,

03:26.3	Accident Pilot	he said a hundred degrees didn't he? [sound of c-chord, similar to altitude alert in background]
03:27.7	Assisting Pilot	yeah. one zero zero.
03:29.1	Accident Pilot	well how come...
03:37.0	Accident Pilot	this right here ain't the heading? I don't know what that is.
03:39.5	Assisting Pilot	it is. but it it's turnin'.

At 03:43.5 elapsed time, Baton Rouge Approach advised the airport was 11 o'clock and 11 miles. The accident pilot told the assisting pilot the airport was in sight, and the assisting pilot told Baton Rouge Approach the airport was in sight. Baton Rouge Approach then cleared N510LD for a visual approach to runway 4L. As the accident pilot was acknowledging the visual approach clearance, the sound of a warbling tone was recorded in the background, similar to the autopilot disconnect tone. The following interaction then occurred,

04:03.7	Accident Pilot	he cleared for the visual?
04:05.6	Assisting Pilot	yeap.
04:05.9	Accident Pilot	okay so we can go below three.

04:07.8	Assisting Pilot	yeap.
04:08.0	Accident Pilot	let's put it on ah fifteen hundred. if you can turn it for me.

At 04:24.6 elapsed time, Baton Rouge Approach told N510LD to contact tower. The assisting pilot acknowledged the frequency change and then contacted Baton Rouge Tower. Baton Rouge Tower cleared the aircraft to land on runway 4L, reporting winds from 310 degrees at 9 knots. The assisting pilot acknowledged the landing clearance to Baton Rouge Tower. The following interaction then occurred,

04:45.6	Assisting Pilot	alright. left and right vanes on.
04:50.2	Accident Pilot	[sound of click] there on. windshields are off.
04:54.1	Assisting Pilot	looks good. speed lookin' good. pressurization set.
05:02.0	Assisting Pilot	landin' lights on.
05:02.9	Accident Pilot	[sound of c-chord, similar to altitude alert]
05:04.3	Accident Pilot	I'll put 'em on when I get the gear down.
05:05.6	Assisting Pilot	if you want em'. you want me to turn the oxygen off?
05:07.5	Accident Pilot	oh yeah. thank you.
05:08.8	Assisting Pilot	alright.

At 05:32.9 elapsed time, the sound of a high pitched whine, similar to gear extension was recorded for about 7 seconds.

At 06:14.2 elapsed time, the accident pilot began the following interaction,

06:14.2	Accident Pilot	well the power setting on this airplane's gotta be a lot lower.
06:17.6	Assisting Pilot	yeah. I--
06:18.1	Accident Pilot	I use six hundred pounds on mine. and I'm down to two hundred pounds and it..it ain't slowin' down much.
06:24.4	Accident Pilot	alright. three greens no red. full flaps indicated. yaw dampner is now off.
06:29.5	Assisting Pilot	there's blue line.
06:33.4	Assisting Pilot	you hit this flight director. take the ahh bars off.

At 06:40.7 elapsed time, an automated voice announced "five hundred."

At 07:13.3 elapsed time, an automated voice announced "fifty forty thirty twenty ten;" during the automated voice, the assisting pilot noted "three green."

At 07:22.6 elapsed time, the aircraft touched down followed by the increased sound of propeller noise, similar to the propellers being operated in ground fine or reverse. The accident pilot told the assisting pilot his requested taxiway, and the assisting pilot then communicated with Baton Rouge Tower.

The pilots then interacted to perform after landing items of flaps up, bleeds off, auto feather off, auto ignition off, pressurization off, "hot five and that's it," and setting aircraft lighting. The assisting pilot continued to communicate with Baton Rouge Ground.

As the aircraft was taxiing to the FBO, the accident pilot began the following interaction,

08:44.9	Accident Pilot	alright now where is the oil temperature.
08:47.8	Assisting Pilot	right here. oil pressure. oil temp.
08:49.6	Accident Pilot	do they have anything that shows a red line on that?
08:52.5	Assisting Pilot	yeah whenever it exceeds it it'll start flashin' red.
08:55.2	Accident Pilot	okay.
08:56.1	Accident Pilot	cause usually with these ice vanes down in the summer...
08:58.3	Assisting Pilot	yeah.
08:58.9	Accident Pilot	...you ain't gonna leave em' down very long.

At 09:10.2 elapsed time, the accident pilot asked the assisting pilot if they forgot anything. After the assisting pilot said, "that's it, man," the accident pilot began a discussion about when to shut down the air conditioners. The accident pilot said he "usually" turned the air conditioner off in order to get the compressor turned off. The assisting pilot agreed, followed by the sound of clicks and a decrease in background noise, similar to the air conditioner being turned off.

The assisting pilot then began this interaction,

09:59.0	Assisting Pilot	alright.
10:00.2	Accident Pilot	now blowers and all that stuff.
10:02.2	Assisting Pilot	blowers stays on.
10:04.3	Accident Pilot	where do you turn everything off at?
10:05.8	Assisting Pilot	right here.
10:07.3	Accident Pilot	okay so the blowers. there's still air blowin' from somewhere.
10:10.3	Assisting Pilot	yeah the blowers stays on automatically.
10:12.1	Accident Pilot	oh it does?
10:12.7	Assisting Pilot	yeah.
10:14.0	Accident Pilot	now you don't have to turn any of this off?
10:15.6	Assisting Pilot	nope. not like the Universal.
10:18.2	Accident Pilot	I don't have to turn anything off but the avionics master.
10:21.2	Assisting Pilot	yeap. and the ESIS.
10:23.8	Accident Pilot	before the master or after?
10:25.4	Assisting Pilot	you can kill it now.
10:26.5	Accident Pilot	okay turn.
10:27.3	Assisting Pilot	yeap.

10:27.9	Accident Pilot	that's off.
10:28.9	Accident Pilot	and then this comes off.
10:30.2	Assisting Pilot	yeap. [sound of click]
10:31.5	Accident Pilot	and now we're ready?
10:35.4		[sound of decreased engine sound, similar to engine spooling down]
10:36.3	Assisting Pilot	that stays on.
10:43.1	Assisting Pilot	till you kill the batteries.
10:45.1	Accident Pilot	[exhaling] Lord have mercy.
10:45.6	Accident Pilot	huh?
10:48.7		[sound of click]
10:50.1		[power interruption to CVR]

The activities of the flight prior to the accident flight ended at 10:50.1 elapsed time.

Accident Flight

Power was restored to the CVR at 10:55.7 elapsed time, which corresponded to 1250:59.2 CDT. The times of the accident flight are expressed as CDT. The format is HHMM:SS.t, where HH is hours, MM is minutes, SS is seconds, and t is tenths of seconds (when applicable).

The accident flight recording began on the ground at Baton Rouge. All talk by the assisting pilot was recorded on the CAM, while the talk of the accident pilot was on the CAM until 1254:14 CDT and on the intercom thereafter.

When the recording resumed, the accident pilot began this interaction at 1250:59 CDT,

1250:59.1	Accident Pilot	now I'm just waitin' on somethin'?
1251:00.1	Assisting Pilot	awe' you ready to light it up.
1251:04.7	Assisting Pilot	parking brake on.
1251:06.0	Accident Pilot	yeah. parking brake set. that's it?
1251:08.1	Assisting Pilot	yeap.
1251:08.9		[sound of click followed by whine, similar to first engine start]

During the first engine start, the pilots discussed the engine temperatures, noting they were close to redline limits but within the acceptable range. After the first engine started, the assisting pilot said, "generator." Thereafter, sounds similar to switches were recorded, followed by an increase in engine noise, similar to the propeller accelerating out of feather.

At 1252:11.0 CDT, the accident pilot said, "they both started about same temperature." To which the assisting pilot replied, "yeah." During this time there was an increase in background sound, similar to the second engine starting.

At 1252:25.0 CDT, the accident pilot said, "alright now I gotta turn this thing on to ahh. avionics and then that thing huh." To which the assisting pilot

replied, "yeah." Thereafter, a click sound was recorded, followed by an electrical modulation sound, and then a beep.

At 1253:37.0 CDT, ATIS information Sierra was recorded. The 1653 Zulu information reported winds from 320 degrees at 4 knots; visibility 10 miles; scattered clouds at 3,300 feet, broken clouds at 4,300 feet, and broken clouds at 6,000 feet; temperature 28 degrees Celsius; dewpoint 20 degrees Celsius; altimeter 29.88 inches of Mercury; runway 31 in use; and various NOTAMS. As the ATIS recording began to loop again, it was interrupted; to which the accident pilot responded with an expletive and noted the ATIS was being updated.

The pilots then continued,

1254:24.1	Assisting Pilot	position initiate.
1254:29.2	Assisting Pilot	[unintelligible]
1254:30.9	Accident Pilot	what now?
1254:32.6	Assisting Pilot	top left...set position.
1254:42.5	Accident Pilot	right here?
1254:43.1	Assisting Pilot	yeap.
1254:46.8	Assisting Pilot	alright. now...flight plan.
1254:54.7	Assisting Pilot	BTR for your origin.
1255:04.9	Assisting Pilot	top left. yeap. execute.
1255:10.1	Assisting Pilot	and McComb for destination.
1255:18.2	Assisting Pilot	top right.
1255:20.4	Accident Pilot	top right?
1255:21.2	Assisting Pilot	yeap.
1255:21.6	Accident Pilot	yeah.
1255:23.2	Accident Pilot	execute?
1255:23.9	Assisting Pilot	yeap.
1255:24.8	Assisting Pilot	alright. legs...put ah McComb one or BTR...nope. ahhh.
1255:41.4	Accident Pilot	doh.
1255:41.7	Assisting Pilot	yeah.
1255:42.1	Accident Pilot	how do I get rid of this now?
1255:43.5	Assisting Pilot	ah clear.
1255:47.9		[ATIS Information Tango begins to play in the background and continues]
1255:50.0	Assisting Pilot	you got put in McComb. type in McComb. KMCB.
1255:59.5	Assisting Pilot	there you go.
1255:59.7	Accident Pilot	is it up here?
1256:01.4	Assisting Pilot	there you go. execute. now its drawing your flight plan. FMS you're ready to go.
1256:08.9	Accident Pilot	FMS. uhm.
1256:11.1	Assisting Pilot	yes. you got your FMS on. take-off. nav. or heading. whatever.
1256:16.0	Accident Pilot	alright let me. let me get my ATIS. they got a new one one now. hold on just a second. and then

then we're gonna. I want to be sure I'm set.

At 1256:29.0 CDT, ATIS information Tango was recorded. The 1753 Zulu information reported winds from 290 degrees at 8 knots; visibility 10 miles; broken clouds at 7,500 feet; temperature 28 degrees Celsius; dewpoint 20 degrees Celsius; altimeter 29.88 inches of Mercury; runway 31 in use; and various NOTAMS.

The following interaction occurred,

1256:34.6	Assisting Pilot	the fuel gauge.
1256:36.9	Accident Pilot	huh.
1256:45.7		[sound of click].
1256:47.0	Assisting Pilot	where is---
1256:47.8	Accident Pilot	trying to find the gauge. usually if you just recycle the thing. reboot it.
1256:55.1	Accident Pilot	[unintelligible] ignitor start [then mumbles unintelligible]
1256:56.4	Accident Pilot	[unintelligible]
1257:03.9	Accident Pilot	supposed to say fuel gauge here somewhere.
1257:18.7	Accident Pilot	you see it?
1257:20.7	Assisting Pilot	no.
1257:21.5	Accident Pilot	well it's here. it's gotta be. firewall. standby. quantity [similar to accident pilot finding/reading circuit breaker labels]. here it is. left and right. and we're talkin' about the left.
12:57:31.0		[sound of click]
1257:36.8	Accident Pilot	that didn't help.
1257:37.5	Assisting Pilot	pull your right one.
1257:41.9		[sound of multiple clicks]
1257:46.0	Accident Pilot	okay. now they both on zero.
1257:50.4	Assisting Pilot	it's on the left one.
1257:52.5		[sound of click, followed the sound of a humming, similar to a motor, followed by the sound of air blowing]
1257:56.6	Assisting Pilot	that's your AC [unintelligible].
1257:58.3	Accident Pilot	that's what?
1257:59.2	Assisting Pilot	push 'em both in.
1258:06.1	Accident Pilot	(et ting ²) comin' on.
1258:42.1	Accident Pilot	I forgot to get the frequency thing [ATIS plays until ground/clearance frequency played].
1259:22.9	Accident Pilot	alright.
1259:25.4	Accident Pilot	what about the ah v-bars up here?

² Items in parentheses () mean the group could not be certain of the words spoken.

1259:31.6	Assisting Pilot	you can put this on three one [sound of rapid clicking, similar to a dial turning]. you're probably gonna' get three one.
1259:34.5	Accident Pilot	yeah. three one.
1259:37.3	Assisting Pilot	I'm just gonna' roll it up [sound of rapid clicking, similar to a dial turning].
1259:41.9	Assisting Pilot	and just whenever you take-off. if you hit autopilot it's automatically gonna kick your yaw dampner on. so it's gonna do both of 'em at the same time. so...
1259:48.8	Accident Pilot	okay.
1259:49.1	Assisting Pilot	so autopilot and.
1259:52.1	Accident Pilot	uh. what else do I need to do?
1259:58.2	Assisting Pilot	that's about it. if you want to put your radar on.
1300:02.5	Accident Pilot	uhm.
1300:03.1	Assisting Pilot	not on the ground.
1300:04.3	Accident Pilot	no.
1300:05.9	Assisting Pilot	just make sure you do like you regular--
1300:07.7	Accident Pilot	turn it on right here.
1300:08.9	Assisting Pilot	yeap. hit it.
1300:11.3	Accident Pilot	but I don't want to turn it on on the ground but.
1300:13.1	Assisting Pilot	I know. but just hit it. and you gotta' go over there. and press ah that button. top. up. okay.
1300:21.0	Accident Pilot	uh.
1300:23.7	Assisting Pilot	and it. you like that format. or is this format. or that one? I like the HSI.
1300:29.6	Accident Pilot	I think that's what I like.
1300:32.7	Accident Pilot	so when I direct to McComb. I can put that in there now.
1300:37.0	Assisting Pilot	well. just wait till you take-off. till he says direct or whatever. I mean you already in there. but direct to McComb and exe--
1300:44.2	Accident Pilot	it's direct to McComb and execute.
1300:45.7	Assisting Pilot	yeah.
1300:46.6	Accident Pilot	alright.
1300:48.1	Accident Pilot	that's all I need to know?
1300:50.8	Assisting Pilot	you got the radios huh.
1300:52.1	Accident Pilot	yeah I think so. I'm just going to stay on the top one. I ain't messing with number two.
1300:54.8	Assisting Pilot	alright.
1300:58.2	Assisting Pilot	you comfortable?
1301:00.5	Accident Pilot	I'm I'm nervous but I think I'm alright. I'll figure it-- I just the only thing I'm nervous about is I don't want to mess up while I'm in their airspace here. and and get in trouble. you know like.

1301:09.2	Assisting Pilot	hand fly.
1301:10.0	Assisting Pilot	make sure yah--
1301:10.4	Accident Pilot	well that's what I'm gonna' do. but I mean uh. wrong or frequency or. squawk. now now to change my squawk. I push this right here.
1301:19.8	Assisting Pilot	right.
1301:20.2	Accident Pilot	and then change it over here and push it again?
1301:22.2	Assisting Pilot	no.
1301:22.6	Accident Pilot	just change it here. I mean push it. then change it. then I'm done.
1301:25.5	Assisting Pilot	push it. change it. then back up on comm.
1301:28.9	Accident Pilot	and then push this one...
1301:29.8	Assisting Pilot	yeah. go ahead.
1301:30.2	Accident Pilot	...to go back to comm.
1301:31.0	Assisting Pilot	right.
1301:32.2	Accident Pilot	okay.
1301:32.9	Assisting Pilot	do you want your clearance now? get it.
1301:35.4	Accident Pilot	yeah. I could do that.

At about 1301:47 CDT, Baton Rouge Ground began to be recorded on the CVR. The accident pilot then called for a VFR clearance to McComb at 2,000 feet. Baton Rouge Ground provided a squawk of 0222 and a departure frequency of 120.3, which the accident pilot read back.

The pilots then continued,

1303:57.0	Accident Pilot	zero-two-two-two. twenty point--
1303:59.3	Assisting Pilot	[unintelligible]
1304:00.2	Accident Pilot	huh?
1304:00.4	Assisting Pilot	yeah. hit comm. get back up on top of here.
1304:03.6	Accident Pilot	oh.
1304:04.0	Assisting Pilot	there you go.
1304:05.2	Accident Pilot	alright.
1304:05.6	Assisting Pilot	it's in.
1304:06.2	Accident Pilot	and then the next one will be ah tower. after that...
1304:09.4	Assisting Pilot	right.
1304:09.7	Accident Pilot	I go ahead and put that in.
1304:13.4	Accident Pilot	and then my next one is going to be twenty point three. I'll I'll know that one.
1304:16.5	Assisting Pilot	that's it man.
1304:17.6	Accident Pilot	uh.
1304:19.3	Accident Pilot	so I'm ready?
1304:20.7	Assisting Pilot	ready to ride.
1304:20.9	Accident Pilot	[chuckle] oh [expletive].

1304:25.3	Assisting Pilot	everything else is the same.
1304:27.3	Accident Pilot	alright my man. just be sure you close that door good. where it where it don't hurt you or somethin'.
1304:30.6	Assisting Pilot	well. been a pleasure.
1304:31.8	Accident Pilot	thank you very very much. and uh.
1304:32.9	Assisting Pilot	anytime.
1304:34.1	Accident Pilot	we. maybe ah. I'm gonna' be comin' to Baton Rouge fairly often. and if you got the time I we can setup a time I could ah meet you here or in Lafayette. and go burn some holes.
1304:43.4	Assisting Pilot	yeah. let me know.
1304:45.7	Accident Pilot	okay. good deal.
1304:47.0	Assisting Pilot	bye buddy.
1304:47.2	Accident Pilot	thank you man.
1304:48.4	Assisting Pilot	have fun this weekend with the kids.
1304:49.4	Accident Pilot	oh thank you [assistant pilot's name]. appreciate everything.
1304:51.6	Assisting Pilot	no problem...hey feather that left side.
1304:57.4	Accident Pilot	say again.
1304:58.1	Assisting Pilot	feather the left side.
1304:59.6	Accident Pilot	the what.
1305:00.0	Assisting Pilot	feather the left side.
1305:00.8	Accident Pilot	okay.
1305:04.8		[sound of engine change, similar to feather of one engine]
1305:05.8	Assisting Pilot	alright I'm out.
13:05:21.9		[sound of two thunks]

At 1305:59.5 CDT, the accident pilot called Baton Rouge Ground for taxi instructions. Baton Rouge Ground provided taxi instructions to runway 31, which the accident pilot readback. The engine sound then changed, similar to an increase in power. During taxi, sounds similar to multiple clicks were recorded.

At 1307:39.8 CDT, the accident pilot called Baton Rouge Tower, reporting ready for take-off on runway 31. Baton Rouge Tower cleared the aircraft for take-off, with a right turn to 040 degrees. The pilot acknowledged the clearance. Thereafter, sounds of rapid clicks, similar to a dial being rotated and switches being operated, were recorded.

At 1308:36.7 CDT, the background sound increased, similar to power being applied for take-off.

At 1308:57.0 CDT, the sound of clicks, similar to switches, was followed by the sound of a whine for six seconds, similar to landing gear retraction.

At 1309:23.9 CDT, the sound of multiple clicks was recorded.

At 1309:48.1 CDT, the sound of a c-chord was recorded, similar to an altitude alert.

At 1309:52.8 CDT, Baton Rouge Tower advised N510LD to contact departure. The accident pilot acknowledged the frequency change, followed by a 0.3-second mid-level tone, similar to the gear warning horn starting and being immediately cancelled (similar to cancellation by activation of the gear warning horn cancel button and/or a change in aircraft power).

At 1310:15.8 CDT, the accident pilot called Baton Rouge Departure, "Hello Baton Rouge Departure King Air ah five [sound of 982Hz steady tone, similar to the stall warning, began] one zero lima delta [sound of radio modulation, similar to microphone being un-keyed for 0.3 seconds] delta is ah...coming up on two thousand zero four zero."

At 1310:23.7 CDT, Baton Rouge Departure advised N510LD he was in radar contact and cleared the aircraft on course to McComb. During this transmission, starting at 1310:24.0 CDT, a 464 Hz warbling tone, similar to the autopilot disconnect tone, was recorded for 2.8 seconds. After this tone ended, the 982 Hz steady tone, similar to the stall warning, was once again audible and continued until the end of the recording.

At about 1310:29.5 CDT, the background sound changed from 263 Hz to 228 Hz over a 4 second period, similar to a change in airflow, engine power, or propeller.

At 1310:30.5 CDT, the accident pilot told Baton Rouge Approach he would fly heading 045 degrees. Baton Rouge Approach responded, advising N510LD that center would not be able to pick the aircraft up on radar at 2,000 feet and Baton Rouge Approach would have to terminate advisories in about 25 miles. The accident pilot acknowledged the transmission.

The remainder of the recording was as follows,

1310:54.0	EGPWS	five hundred.
1310:55.4	EGPWS	too low gear.
1310:57.0	EGPWS	pull up.
1310:57.6		[change in background sound, similar to propeller rpm surge for 1.8 seconds]
1310:58.6	EGPWS	pull up.
1310:58.8	CAM	[sound of rattle]
1311:00.1	EGPWS	pull up.
1311:01.9	EGPWS	pull up.
1311:02.5	Accident Pilot	I'm fixin' to crash.
1311:03.7	EGPWS	pull up.
1311:05.2	Baton Rouge Approach	who's us--
1311:05.3	EGPWS	terrain. terrain--
1311:05.9	CAM	[sound of impact]

The recorded ended at about 1311:06 CDT.

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.