

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



GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

DCA15LA173

By

Joe Gregor

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

March 7, 2016

Cockpit Voice Recorder

Group Chairman's Factual Report By Joe Gregor

1. EVENT SUMMARY

Location: Charlotte, North Carolina
Date: August 15, 2015
Aircraft: Airbus A321, Registration N564UW
Operator: American Airlines
NTSB Number: DCA15LA173

On August 15, 2015, about 1837 eastern daylight time, American Airlines flight 1851, an Airbus A321, N564UW, reportedly encountered wind shear while on final approach to the Charlotte Douglas International Airport (CLT), Charlotte, North Carolina. The airplane touched down short of the runway in the paved overrun area and performed a go-around before circling back and successfully landing. There were no injuries to the 6 crew members and 153 passengers onboard. The airplane was substantially damaged when it struck several runway end lights and experienced a tail strike during the go around. The flight was operating under the provisions of 14 Code of Federal Regulations Part 121, as a scheduled domestic passenger flight and originated from Hartsfield - Jackson Atlanta International Airport (ATL), Atlanta, Georgia.

A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Division for evaluation. The CVR group meeting convened on August 17, 2015 and a partial transcript was prepared for the 2-hour, 4-minute, 14-second digital recording (see attached).

2. GROUP

Chairman:	Joe Gregor Electronic Engineer National Transportation Safety Board
Member:	Ron Rifenberg Air Safety Investigator Federal Aviation Administration
Member:	Capt. Tom Webb A320 Check Airman American Airlines

Member: Capt. Rudy Canto, Jr.
Senior Director, Safety, Security and Technical Affairs
Airbus

Member: Capt. Jeff Diercksmeier
National Safety Committee – Accident Investigation
Allied Pilots Association

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model: **Honeywell 6022**
Recorder Serial Number: **14914**

3.1 CVR Carriage Requirements

Per federal regulation, a turbine engine powered aircraft operating under 14 CFR Part 121 must be equipped with a CVR that records a minimum of the last 2 hours of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 2 hours of CVR operation.

3.2 Recorder Description

This model CVR, the Honeywell 6022, records a minimum of 120 minutes of digital audio stored in solid state memory modules. Four channels are recorded: one channel for each flight crew, one channel for a cockpit observer, and one channel for the cockpit area microphone (CAM).

3.3 Recorder Damage

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

3.4 Audio Recording Description

Each channel's audio quality is indicated in Table 1.¹ Channel number three did not contain any audio information (nor was it required by federal regulations).

Table 1: Audio Quality.			
Channel Number	Content/Source	Quality	Duration
1	Captain (CAPT)	Excellent	120 min
2	First Officer (FO)	Excellent	120 min
3	Other	Excellent	120 min
4	CAM	Good	120 min

¹ See attached CVR Quality Rating Scale.

3.5 Timing and Correlation

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, 59 radio transmissions that the aircraft made were correlated to the radio transmit microphone key parameter from the FDR. Each of these radio transmissions acted as an anchor point for a linear interpolation between the remaining CVR events. Once a correlation between the two recorders was established, a reference to Universal Coordinated Time (UTC) as recorded on the FDR was employed and all times referenced in the remainder of this report are referenced in UTC.

3.6 Description of Audio Events

The recording began with sounds consistent with a previous flight and flight crew. This approximately 30-minute long segment was not time correlated. At approximately 2129:15 UTC, the CVR recorded sounds consistent with an electrical power transition. Approximately 14 seconds later, the CVR recorded a flight attendant giving an initial passenger briefing, followed by three subsequent passenger briefings by the flight attendant and the flight crew. For the next approximately 12-minutes, the CVR recorded sounds consistent with engine start, pushback, and taxiing to the runway for takeoff.

At 2158:43 UTC, the CVR recorded sounds consistent with a FLEX takeoff run. At 2200:25 UTC, the FO was recorded contacting departure, followed eight seconds later with the crew calling for flaps up and performing the after takeoff checklist. At 2200:29 UTC, the CVR recorded a radio transmission announcing convective SIGMET five eight central. Approximately 3-1/2 minutes later, the CAPT gave an approach briefing. At 2216:53 UTC, the FO made a passenger announcement announcing their descent into Charlotte. At 2217:42 UTC, the flight was directed to descend to 11,000 feet. Approximately 1-1/2 minutes later, the CVR recorded a radio transmission announcing convective SIGMET sixty one eastern. At 2219:54 UTC, the CVR recorded sounds consistent with performance of the descent and approach checklists, followed by a crew discussion concerning the radar weather depiction and the weather at Charlotte.

The transcript begins at 2223:13 UTC, with the flight crew establishing contact with Charlotte approach. The transcript ends at 2238:50 UTC, with the CAPT announcing over the radio that the flight had received a wind-shear warning at 10 feet.

At 2239:07 UTC, the CVR recorded sounds consistent with performance of the takeoff checklist, followed by a PA announcement to the passenger and intercom coordination with the cabin crew. At 2242:20 UTC, the CVR recorded a radio transmission announcing a runway change to runway 36C for wind shear, followed by the CAPT noting that they should do a good post-flight inspection due to the firmness of the landing. At 2245:09 UTC, the CVR recorded sounds consistent with checklist performance including an approach briefing for a flaps 3 approach. At 2247:50 UTC, the FO noted that, "I don't hear anybody going around." At 2248:45 UTC, tower cleared

the flight to land on runway 36C and informed them that they were number 4 for the approach. This was followed by a brief cockpit crew discussion concerning potential alternate landing field options. At 2251:36 UTC, the CAPT noted, "There's nothing at the field now."

At 2252:05 UTC, the CVR recorded sounds consistent with landing gear extension, followed by an announcement that the landing checklist was complete. Approximately 20 seconds later, the crew noted changing winds and soon thereafter, at 2253:11 UTC, the CAPT noted, "unstable speed correcting." Approximately 30 seconds later, an electronic voice announced, "five hundred," followed by the FO stating, "stable target sink eight." At 2253:49 UTC, the CAPT announced, "autopilot's off," followed 14 seconds later by, "landing." At 2254:27 UTC, the CVR recorded sounds consistent with aircraft touchdown. The remainder of the CVR recorded sounds consistent with after landing activities including the CAPT contacting maintenance to report the wind-shear warning along with an anomalous outflow valve indication and a few dropped oxygen masks in the passenger cabin.

The recording ended at 2303:04 UTC.

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.

Transcript of a Honeywell 6022 solid-state cockpit voice recorder, serial number 14914, installed on an Airbus A321 (N564UW), which encountered wind-shear upon landing at Charlotte, NC.

LEGEND

CAM	Cockpit area microphone voice or sound source
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from N564UW
CTR	Radio transmission from the center controller
APR	Radio transmission from the Charlotte approach controller
TWR	Radio transmission from the CXO airport tower controller
FA	Flight attendant audio panel voice or sounds
PA	Public address system voice or sounds
INT	Intercom system voice or sounds
-1	Voice identified as the captain or head flight attendant
-2	Voice identified as the first officer
-?	Voice unidentified
*	Unintelligible word
#	Expletive
@	Non-pertinent word
()	Questionable insertion
[]	Editorial insertion

Note 1: Times are expressed in universal coordinated time.

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

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

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

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>
20:58:57	Start of Recording
22:23:13	Start of Transcript
22:23:13.5 HOT-2	is that approach, I forget.
22:23:14.8 HOT-1	yup Charlotte approach.
22:23:31.6 HOT-1	unicorn?
22:23:35.8 HOT-1	what's changed?
22:23:46.3 HOT-1	now you had the full thing so it's gonna, message.
22:23:50.1 HOT-2	yeah.
22:23:52.3 HOT-1	if you put just C-L-T in, it prints.

<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:23:16.3 RDO-2	approach good afternoon American eighteen fifty one ah one one thousand with ah information tango.
22:23:23.6 APR	American eighteen fifty one Charlotte approach ATIS uniform is now current expect three six left.
22:23:28.4 RDO-2	three six left we'll * up uniform.

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:23:53.3 HOT-2	I know, yeah, but sometimes when you do that it doesn't give you the arrival.		
22:23:57.0 HOT-1	it'll always give you the arrival, it won't give you the departure.		
22:23:58.4 HOT-2	oh right.		
22:24:01.6 HOT-2	so that's how it works.		
22:24:02.2 HOT-1	if you have split, ATISs.		
22:24:21.2 HOT-1	(since) we've all learned by trial and error you know there's no [sound similar to chuckle].		
22:24:27.1 HOT-2	(roger that).		
		22:24:39.6 APR	American eighteen fifty one turn right heading zero eight zero descend and maintain seven thousand.
		22:24:46.1 RDO-2	heading zero eight zero seven thousand American eighteen fifty one.
22:24:49.5 HOT-1	seven thousand.		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:24:50.2 HOT-2	seven.		
22:24:50.9 HOT-2	would you like me to clean it up for you?		
22:24:52.5 HOT-1	ah I got it, thanks.		
22:24:53.8 HOT-2	all right then.		
22:24:54.7 HOT-1	you're working on, unicorn.		
22:24:56.6 HOT-2	ah no, but apparently unicorn * unicorn just got here.		
22:25:11.1 HOT-1	ten thousand.		
22:25:12.5 HOT-2	ding ding.		
22:25:18.0 HOT-1	* * * *.		
22:25:18.3 PA-1	flight attendants prepare for landing.		
22:25:22.6 HOT-2	same thing.		
22:25:24.2 HOT-2	nothing's changed.		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
		22:25:25.1 FA-1	to prepare for landing please close your tray table and put away carry-on items. place your seat in the original upright position. we will now collect any items you wish to discard. please put away large electronic devices including laptops computers, secure smaller handheld devices in your hand or seat pocket. devices must remain in airplane mode until after we land. we'll be landing soon.
22:25:36.4 HOT-1	* the weather's the same there must some, bird or (I don't know), mowing.		
22:25:42.0 HOT-2	yeah.		
22:25:43.7 HOT-1	what is the difference? ah.		
22:25:45.6 HOT-2	I didn't see any.		
22:25:47.0 HOT-1	mowing adjacent *, use caution taxiway charlie detour in effect okay, low level - ah - low level wind-shear advisory's in effect with the weather at zero, * winds at zero.		
22:25:47.0 HOT-2	* * *.		
22:25:53.3 HOT-2	ah.		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:26:01.4 HOT-1	what does that mean?	22:26:03.3 APR	American eighteen fifty one when you reach seven thousand reduce speed to two one zero.
22:26:12.0 HOT-1	roger.	22:26:07.6 RDO-2	once at seven thousand two ten on the speed American eighteen fifty one.
22:26:14.0 CAM-2	I think we (can) * *.		
22:26:26.2 HOT-1	hey there's a cell really pretty close to the airport now.		
22:26:29.9 HOT-2	what that one there?		
22:26:31.5 HOT-1	yep.		
22:26:34.7 HOT-1	that's probably why they put that out. in case it generates a little, breeze, with it.		
22:26:38.9 HOT-2	rumble.		
22:26:42.3 HOT-2	a little rumble in the jungle.		
22:26:59.9 HOT-1	eight for seven.		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>
22:27:01.4 HOT-2	eight for seven.
22:27:57.3 HOT-2	(want five) right, (want five) left.
22:28:03.9 HOT-1	six thousand.
22:28:04.6 HOT-2	six.
22:28:16.7 HOT-1	flaps one.
22:28:17.8 HOT-2	flaps one.
22:28:40.0 HOT-1	I cheated a little left. he'll never know.

<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:27:19.5 APR	American eighteen fifty one contact Charlotte final one three two point seven good day.
22:27:25.2 RDO-2	thirty two point seven American eighteen fifty one see ya.
22:27:33.9 RDO-2	final good afternoon American eighteen fifty one seven thousand.
22:27:57.5 APR	American eighteen fifty one Charlotte approach descend and maintain six thousand.
22:28:01.3 RDO-2	six thousand *, American eighteen fifty one.

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:28:41.8 HOT-2	yeah.		
22:28:43.9 HOT-2	got my vote.		
22:29:06.9 HOT-2	there's a balloon right there.		
22:29:08.2 HOT-1	whoa.		
		22:29:13.1 APR	American eighteen fifty one turn right heading zero niner zero.
		22:29:16.0 RDO-2	heading zero niner zero American eighteen fifty one.
22:29:24.7 HOT-1	Mylar balloon six thousand feet.		
22:29:27.1 HOT-2	six thousand.		
22:29:35.0 HOT-2	that's the ah, paper mill (I think it's) about twenty miles away from ah * threshold.		
22:29:40.4 HOT-1	(Bowater).		
22:30:21.4 HOT-1	tell you what I'm gonna put a baro in there just in case I lose it.		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
		22:30:43.4 APR	American eighteen fifty one turn left heading zero three zero intercept runway three six left localizer.
		22:30:47.9 RDO-2	zero three zero to intercept the three six left localizer American eighteen fifty one.
		22:31:20.3 APR	American eighteen fifty one descend and maintain four thousand.
		22:31:22.9 RDO-2	four thousand American eighteen fifty one.
22:31:25.0 HOT-1	four.		
22:31:25.6 HOT-2	four.		
22:31:32.0 HOT-1	*, that's that same shower we were lookin' at.		
22:31:49.2 HOT-2	it's right over there.		
22:31:50.6 HOT-1	I see the - field in general I just was. can't see the runway in particular. [sound similar to chuckle].		
22:31:58.2 HOT-2	right.		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
		22:31:59.3 APR	American eighteen fifty one. five miles from CUNUK cross CUNUK at four thousand cleared ILS runway three six left approach.
22:32:00.7 HOT-2	no I didn't.		
		22:32:06.6 RDO-2	cross CUNUK at four thousand cleared for the ah ILS three six left approach American ah eighteen fifty one.
22:32:12.9 HOT-1	alright.		
22:32:17.3 HOT-2	American.		
22:32:19.1 HOT-1	five for four.		
22:32:20.2 HOT-2	five four.		
22:32:33.7 HOT-2	huh. That thing a really is just like on the approach end isn't it?		
22:32:37.7 HOT-1	hmm hum.		
		22:32:38.2 APR	American eighteen fifty one maintain one seven zero knots until NLSON.

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>
22:32:45.6 HOT-1	flaps 2.
22:32:47.3 HOT-2	flaps.
22:32:48.5 HOT-1	that is right over the, field.
22:32:51.8 HOT-1	oh I can see the, field.
22:32:54.3 HOT-2	right.
22:32:55.7 HOT-1	its already cleared the right half.
22:32:57.5 HOT-2	correct.
22:33:19.4 HOT-2	glideslope and *.
22:33:21.5 HOT-1	missed, set, it's four thousand.
22:33:23.6 HOT-2	thank you.

<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:32:42.5 RDO-2	okay one seventy until NLSON American eighteen fifty one.

22:33:27.9 APR	American eighteen fifty one contact tower at NLSON one three three point three five.
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<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
		22:33:32.0 RDO-2	tree tree tree five American eighteen ah fifty one see ya.
22:34:06.9 HOT-1	Carowind's busy.		
22:34:08.4 HOT-2	yeah it is.		
22:34:16.7 HOT-1	well, low autobrake with the wet runway there.		
22:34:19.0 HOT-2	rog.		
22:34:20.6 CAM	two thousand five hundred [electronic voice].		
22:34:22.1 HOT-2	(that's) what she says.		
22:34:34.0 HOT-1	autopilot's off.		
22:34:35.7 HOT	[sound of autopilot disconnect warning].		
22:34:38.6 HOT	[sound of mode reversion alert].		
22:34:51.7 HOT-1	gear down flaps three landing checklist.		
22:34:54.0 HOT-2	gear down. flaps three.		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>
22:34:54.3 CAM	[sound of increased background noise].
22:35:03.9 HOT-1	flaps full.
22:35:06.7 HOT-2	flaps full.
22:35:06.8 HOT-1	we're inside NLSON for tower.
22:35:08.0 HOT-2	yup.
22:35:17.1 HOT-1	three three three five.
22:35:19.2 HOT-2	three three three five?
22:35:21.8 HOT-2	thank you.

<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:35:09.6 RDO-2	tower American eighteen fifty one inside NLSON.
22:35:22.9 RDO-2	tower American eighteen fifty one inside NLSON.

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
		22:35:26.9 TWR	American eighteen fifty one Charlotte tower following a CRJ three ahead (runway) three six left cleared to land wind three one zero at six gust one six runway three six left arrival wind-shear alert two zero knot loss on a one mile final several aircraft reported between eight and a fifteen knot gain around three hundred feet.
22:35:41.0 HOT-1	*.		
		22:35:41.1 RDO-2	copy all that and ah we're cleared to land American eighteen fifty one.
22:35:44.8 HOT-2	alright * (landing) altimeters verify thirty ten sixteen sixty.		
22:35:50.0 HOT-1	thirty ten checks.		
22:35:51.6 HOT-2	engine mode is normal landing gear verify down and three green.		
22:35:55.1 HOT-1	down three green. stable.		
22:35:55.1 CAM	one thousand [electronic voice].		
22:35:56.3 HOT-2	* verify landing * * check?		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:35:58.5 HOT-1	landing signs (blue status) check.		
22:36:00.1 HOT-2	landing check(list) is complete.		
22:36:03.1 HOT-1	somebody just went around.		
22:36:05.6 HOT-2	ah probably the RJ in front of us? I don't see him on the runway.		
22:36:16.3 HOT-1	there's a little gain right there.		
22:36:38.5 HOT-2	* five hundred, stable, target, sink seven.		
22:36:39.3 CAM	hundred above [electronic voice].		
22:36:42.0 HOT-1	landing.		
22:36:46.8 CAM	minimum [electronic voice].		
22:36:52.8 CAM	[increase in high frequency background noise, sound similar to windshield wiper].		
22:36:56.5 HOT-1	nice.		
22:36:57.5 CAM	one hundred [electronic voice].		
22:36:58.8 HOT-2	alright here's the wind-shear.		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>
22:36:59.5 CAM	wind-shear, wind-shear, wind-shear [electronic voice].
22:37:00.8 HOT-1	go around, TOGA.
22:37:02.1 CAM	ten. [electronic voice].
22:37:02.7 CAM	[sound of impact].
22:37:03.4 HOT-1	# #.
22:37:05.2 HOT-2	alright.
22:37:05.7 HOT	[sound similar to triple click alert].
22:37:12.3 HOT-2	TOGA set.
22:37:13.4 HOT-1	thanks.
22:37:14.0 HOT-2	* rate.

<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:37:06.1 RDO-2	American eighteen fifty one on the go around.
22:37:08.2 TWR	American eighteen fifty one, roger, climb maintain four thousand, when able, turn left heading two seven zero.

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:37:16.1 HOT-2	you want, flaps go around?		
22:37:18.4 HOT-1	no not yet.		
22:37:19.2 HOT-2	no? okay.		
22:37:19.6 HOT-1	now, now we're out of it.		
22:37:21.1 HOT-1	go around flap - positive rate gear up.		
22:37:23.0 HOT-2	positive rate gear up.		
22:37:24.6 HOT-1	go around flaps.		
22:37:25.5 HOT-2	go around flaps, flaps two.		
		22:37:34.8 TWR	American eighteen fifty one maintain four thousand when able fly heading two seven zero.
		22:37:39.0 RDO-2	okay four thousand heading two seven zero American ah eighteen fifty one and we had a about a twenty knot wind shear at a loss of speed at about ah oh - ten feet about.
22:37:48.9 CAM	[sound of single chime, similar to ECAM alert].		

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>
22:37:49.2 HOT-1	ten feet.
22:38:00.4 HOT-1	alright.
22:38:00.8 HOT-2	alright.
22:38:01.6 HOT-2	so, let's see.
22:38:02.5 HOT-1	four thousand feet heading two seven zero.
22:38:04.9 HOT-2	two seven zero and we are flaps two.
22:38:08.4 HOT-1	flaps one.
22:38:09.1 HOT-2	flaps one.
22:38:18.0 HOT-1	well, that wasn't good.
22:38:20.3 HOT-2	* * * * .

<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:37:51.0 TWR	you said a twenty knot loss about ten feet?
22:37:53.0 RDO-2	yes sir.
22:37:53.7 TWR	roger.

<u>TIME and SOURCE</u>	<u>INTRA-COCKPIT COMMUNICATION</u> <u>CONTENT</u>	<u>TIME and SOURCE</u>	<u>AIR-GROUND COMMUNICATION</u> <u>CONTENT</u>
22:38:34.6 HOT-1	flaps up.		
22:38:34.6 CAM	[sound similar to altitude alert tone].		
22:38:35.3 HOT-2	flaps up.		
22:38:37.0 HOT-1	three for four.		
22:38:38.0 HOT-2	three for four.		
		22:38:38.8 RDO-1	American eighteen fifty one had a wind shear warning at ten feet. wind shear warning.
22:38:50	End of Transcript		
23:03:04	End of Recording		