

**NATIONAL TRANSPORTATION SAFETY BOARD**  
**Vehicle Recorders Division**  
**Washington, D.C. 20594**



**SPECIALIST'S FACTUAL REPORT OF INVESTIGATION**

**DCA99MA060**

by

**Albert G. Reitan**  
**Transportation Safety Specialist**

**Warning**

The reader of this report is cautioned that the transcription of a CVR tape is not a precise science but is the best product possible from an NTSB group investigative effort. The transcript, or parts thereof, if taken out of context, could be misleading. The attached CVR 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 Recorders Division  
Washington, D.C. 20594

December 12, 1999

## **Cockpit Voice Recorder - 12**

**Group Chairman's Factual Report**  
by **Albert G. Reitan**

**A. ACCIDENT**

Location: Little Rock Adams Airport, Arkansas  
Date: June 1, 1999  
Time: 1150 PM Central daylight time (CDT)  
Aircraft: American Airlines, flight 1420, McDonnell Douglas MD-82  
N215 AA  
NTSB Number: DCA99MA060

**B. GROUP**

Chairman: Albert G. Reitan  
Transportation Safety Specialist (CVR)  
National Transportation Safety Board

Member: Lyle K. Streeter  
Air Safety Investigator  
Federal Aviation Administration

Member: Captain Randy Wyatt  
Experimental Test Pilot  
Boeing (Douglas Products Division)

Member: Captain Mark Popisil  
Chief Pilot, Chicago  
American Airlines

Member: Captain Jon F. Jefferies  
Base Safety Coordinator  
Allied Pilots Association  
American Airlines

## **C. SUMMARY**

A Fairchild model A-100A cockpit voice recorder (CVR), s/n 53282, was brought to the audio laboratory of the National Transportation Safety Board on June 2, 1999. The Cockpit Voice Recorder committee convened on June 3, 1999. A transcript was prepared of the entire thirty one minutes and five second recording. (attached)

## **D. DETAILS OF INVESTIGATION**

On June 1, 1999, an American Airlines MD-82 was cleared for an ILS approach to runway four right at the Little Rock Adams Airport. After touchdown, during a rain storm, the aircraft overran the end of the runway and impacted an approach lighting structure. The aircraft was destroyed by the impact and post-crash fire. Nine of the one hundred thirty five passengers and crew suffered fatal injuries.

The exterior of the CVR showed no evidence of structural damage. The exterior case was covered with a coating of soot. The interior of the recorder and the tape sustained no apparent heat or impact damage. A Dukane underwater locator beacon (ULB) was installed and when tested in the laboratory, was found to operate satisfactorily.

The recording consisted of four channels of good quality audio information. One channel contained the cockpit area microphone audio information. Two other channels contained the Captain and First Officer audio panel information. The fourth contained interphone and public address information. Timing on the tape was established using events recorded on an ATC transcript supplied by the Federal Aviation Administration.

The CVR data started at 1119:44 p.m. CDT, and continued uninterrupted until 1150:48 CDT when electrical power was removed from the CVR. The transcript contained the preparation for approach, descent, and landing. The recording ended as the aircraft departed the end of the runway and came to a stop.

As part of the Safety Board's accident investigation process, the first officer was invited to review the CVR transcript and suggest corrections or additions. On January 12, 2000, he reviewed the recording and suggested the following changes to the transcript. The Board reviewed these changes and decided not to incorporate them into the transcript.

1136:11

**CAM-2** ah, it's twenty five. I will look that up.

1136:20

**CAM** [sound similar to first officer's work table being moved]

1147:46

**CAM** [sound similar to landing gear being operated. shortly afterward, a definitive clicking sound is heard]

1149:58.5

**CAM-?** go \*\*.

1150:21.2

**CAM** [sound of two thuds similar to aircraft touching down on runway concurrent with unidentified squeak sound. squeak sound is similar to spoilers being deployed]

*[original signed]*

Albert G. Reitan  
Transportation Safety Specialist (CVR)

Attachments:

**Transcript of a Fairchild A-100A cockpit voice recorder (CVR), s/n 53282, installed on an McDonnell Douglas MD-82, N215AA, which over-ran the runway at the Little Rock Adams Airport, on June 1, 1999.**

## LEGEND

<b>RDO</b>	Radio transmission from accident aircraft
<b>CAM</b>	Cockpit area microphone voice or sound source
<b>PA</b>	PA voice transmitted over aircraft public address system
<b>INT</b>	Voice transmitted over aircraft interphone system
<b>CTR</b>	Radio transmission from Little Rock center controller
<b>APR</b>	Radio transmission from the Little Rock approach/tower controller
<b>-1</b>	Voice identified as Pilot-in-Command (PIC)
<b>-2</b>	Voice identified as Co-Pilot (SIC)
<b>-3</b>	Voice identified as 1 <sup>st</sup> female flight attendant
<b>-4</b>	Voice identified as 2 <sup>nd</sup> female flight attendant
<b>-5</b>	Voice identified as aircraft mechanical voice
<b>-?</b>	Voice unidentified
<b>*</b>	Unintelligible word
<b>@</b>	Non-pertinent word
<b>#</b>	Expletive
<b>- - -</b>	Break in continuity
<b>( )</b>	Questionable insertion
<b>[ ]</b>	Editorial insertion
<b>.....</b>	Pause

Note 1: Times are expressed in central daylight time (CDT).

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.

## CVR Quality Rating Scale

The levels of recording quality are characterized by the following traits of the cockpit voice recorder information:

- |                          |   |
|--------------------------|---|
| <b>Excellent Quality</b> | 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.   |
| <b>Good Quality</b>      | 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.  |
| <b>Fair Quality</b>      | 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.  |
| <b>Poor Quality</b>      | 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. |
| <b>Unusable</b>          | 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.   |

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1119:44	<b>Start of Recording</b> <b>Start of Transcript</b>		
1119:48	<b>CAM-2</b> I warmed it up pretty good.		
1119:50	<b>CAM-1</b> aah.		
1119:51	<b>CAM-2</b> like it. ** ...		
1119:51	<b>CAM-1</b> actually, it's getting pretty hot.		
1120:02	<b>CAM-2</b> did they complain about the temperature?		
1120:04	<b>CAM-1</b> naw, it's getting warm up here.		
1120:06	<b>CAM-2</b> ah, okay.		
		1120:10	<b>CTR</b> American fourteen twenty, are you gonna want still want lower?
1120:13	<b>CAM-1</b> ah, so far it's okay.		
		1120:15	<b>RDO-2</b> so far so good ma'am. fourteen twenty we'll let you know.
		1120:19	<b>CTR</b> right.

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1120:47 <b>CAM-2</b>	twenty five for twenty four. set and armed.		
1120:56 <b>CAM-2</b>	this stuff is working out pretty well. * get ahead of that stuff.		
1121:40 <b>CAM-1</b>	** , we're almost down to max landing weight.		
1121:50 <b>CAM-1</b>	we'll be there.		
1121:52 <b>CAM-2</b>	yeah.		
1122:12 <b>CAM-2</b>	you want to use one thirty, right?		
1122:14 <b>CAM-1</b>	yeah, well. I don't know. we've got a hundred miles to go. yeah, I guess so.		
1122:27 <b>CAM-1</b>	and we'll use flaps forty since **.		
1122:30 <b>CAM-2</b>	sure.		
1122:42 <b>CAM-?</b>	**.		
1122:45 <b>CAM-?</b>	**.		
1122:57 <b>CAM-1</b>	we're right on the edge of this **.		
1123:19 <b>CAM-?</b>	**.		



## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1123:53 <b>CAM-2</b>	this is the ground over here on the right.		
1123:55 <b>CAM-1</b>	yeah I see an occasional ground **.		
1124:08 <b>CAM-?</b>	[sound of yawn]		
1124:20 <b>CAM-1</b>	boy, this is too much (return).		
1124:40 <b>CAM</b>	[sound of "ding dong" similar to flight attendant call chime]		
1124:43 <b>CAM-2</b>	there's a moon out there. or a space ship.		
1124:49 <b>CAM-1</b>	yeah. the mother ship.		
1124:52 <b>CAM-2</b>	[sound of chuckle] got your Nike's on?		
1124:56 <b>CAM-1</b>	yeah, right.		
1124:57 <b>CAM-3</b>	[sound of chuckle]		
1124:59 <b>CAM-1</b>	what was that guy's name?		
1125:00 <b>CAM-2</b>	@, @ or.		
1125:02 <b>CAM-1</b>	yeah @.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1125:06 <b>CAM-2</b>	center pumps comin' off.		
1125:07 <b>CAM-1</b>	all right.		
1125:08 <b>CAM</b>	[sound of two clicks]		
1125:13 <b>CAM-2</b>	there's you're big wadiddily.		
1125:15 <b>CAM-1</b>	yeah.		
1125:19 <b>CAM-2</b>	thirteen miles?		
1125:21 <b>CAM-?</b>	***.		
1125:26 <b>CAM</b>	[sound similar to ice bag being struck in galley]		
1125:43 <b>CAM-1</b>	we got to get over there quick.		
1125:48 <b>CAM-2</b>	I don't like that.... that's lightning.		
1125:56 <b>CAM-1</b>	sure is.		
1126:20 <b>CAM-2</b>	oh.		
1126:36 <b>CAM-1</b>	that's about as far as we can go.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1126:37 <b>CAM-2</b>	yeah, I would say right about. maybe a little bit more and that's about it. we could start down here pretty soon.		
1126:45 <b>CAM-1</b>	I'm gonna ask her to come **...		
1126:48 <b>CAM-1</b>	this is the bowling alley right here.		
1126:50 <b>CAM-2</b>	yeah, I know.		
1126:55 <b>CAM-1</b>	in fact those are the city lights straight out there.		
1126:57 <b>CAM-2</b>	that's it.		
1127:03 <b>CAM-2</b>	want to go down?		
1127:05 <b>CAM-1</b>	uuh, not just yet.... but, pretty soon.		
1127:10 <b>CAM-1</b>	(seventy two), yeah.		
1127:11 <b>CAM-?</b>	**.		
		1127:11 <b>CTR</b>	American fourteen twenty descend and maintain one zero thousand. the, Little Rock altimeter, is two niner eight six.

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1127:23 <b>CAM-1</b>	ten set and armed.	1127:20 <b>RDO-2</b>	ten thousand, two niner eight six. American fourteen twenty, thanks.
1127:24 <b>CAM-2</b>	thanks.		
1127:27 <b>PA-1</b>	uh, we're now just uh, eighty miles from the airport and we have started our descent uh, toward it. quite a light show off the left hand side of the aircraft. we'll be passing that on our way toward Little Rock.... and we should be landing here in about uh, probably about twenty minutes. I'm gonna have to slightly over-fly the airport, in or.. order to turn back around to land. it's been a pleasure having you on board for this short flight and I'd like to take this opportunity to thank you for flying American Airlines.		
1128:02 <b>CAM-2</b>	descent checks are complete.		
1128:04 <b>CAM-1</b>	okay.		
		1128:19 <b>CTR</b>	American fourteen twenty contact Memphis center one three five point eight. good day.
		1128:23 <b>RDO-2</b>	thirty five eight, American fourteen twenty, good night.
1128:26 <b>CAM-1</b>	we gotta get there quick.		
1128:27 <b>CAM-2</b>	yep.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1128:40 <b>RDO-2</b>	American fourteen twenty leaving two two zero for one zero thousand.
		1128:47 <b>CTR</b>	Amer.. fourteen twenty, Memphis rog ..
1128:58 <b>CAM-2</b>	sit'em down early?		
1128:59 <b>CAM</b>	[sound of "ding dong, ding dong" similar to flight attendant call chime]		
1129:03 <b>INT-3</b>	this is Nancy.		
1129:04 <b>INT-1</b>	yeah, how you guys uh, doing back there?		
1129:05 <b>INT-4</b>	this is Jennifer.		
1129:06 <b>INT-1</b>	yeah, how you guys doing back there?		
1129:07 <b>INT-4</b>	um, pretty okay.		
1129:08 <b>INT-3</b>	they're still out in the in the aisle with the cart doing the service.		
1129:11 <b>INT-4</b>	yeah.		
1129:11 <b>INT-1</b>	really uh...		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1129:12 <b>INT-3</b>	yeah.		
1129:12 <b>INT-1</b>	it's uh, I think it's gonna get a little bumpy here again and if you don't mind uh....		
1129:15 <b>INT-4</b>	do we need to sit down?		
1129:16 <b>INT-1</b>	yeah, how far through are you?		
1129:18 <b>INT-4</b>	we're almost done but not quite, so...		
1129:20 <b>INT-1</b>	okay, well, finish it real quick.		
1129:21 <b>INT-4</b>	okay.		
1129:22 <b>INT-1</b>	alright.		
1129:22 <b>INT-4</b>	'bye.		
1129:23 <b>INT-1</b>	'bye.		
		1129:32 <b>CTR</b>	American fourteen twenty, roger. Little Rock altimeter's two niner eight six.
		1129:37 <b>RDO-2</b>	two niner eight six, American fourteen twenty.

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1129:44 <b>CAM-2</b>	yeah, that alley's getting' big.. closing to the west.		
1129:48 <b>CAM-1</b>	yeah it is.		
1129:49 <b>CAM-2</b>	* be okay.		
1129:52 <b>CAM-2</b>	I say we get down as soon as we can.		
1129:56 <b>CAM-1</b>	two nine eight six?		
1129:57 <b>CAM-2</b>	* nine eight six. altimeters are set and cross checked.		
1130:06 <b>CAM-2</b>	aw #, no right side **.		
1130:49 <b>CAM-2</b>	okay, hydraulic pumps are on, high, and on.		
1130:52 <b>CAM-1</b>	okay.		
1130:52 <b>CAM-2</b>	altimeters? two nine eight six.		
1130:56 <b>CAM-1</b>	reset, two nine eight six.		
1130:57 <b>CAM-2</b>	flight instruments and bugs?		
1130:59 <b>CAM-1</b>	uuh, I got a hundred, and thirty.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1131:03 <b>CAM-2</b>	yeah.		
1131:05 <b>CAM-1</b>	with the flaps forty, a hundred and thirty thousand pounds. four hundred and sixty feet, two hundred feet *** ...		
1131:13 <b>CAM-2</b>	set and cross checked.		
1131:15 <b>CAM-2</b>	tail de-ice? uh, not required?		
1131:18 <b>CAM-1</b>	uh, not required.		
1131:19 <b>CAM-2</b>	manual brakes?		
1131:21 <b>CAM-1</b>	uuh, manual's fine.		
1131:29 <b>CAM-1</b>	I have to go a little to the right here.		
1131:30 <b>CAM-2</b>	yeah.		
1131:31 <b>CAM-?</b>	(don't turn left)		
1131:35 <b>CAM-2</b>	actually there's the city right there.		
1131:36 <b>CAM-1</b>	yeah.		
1131:39 <b>CAM-2</b>	breaking out of this (crud). good.... doing good.		



## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1131:52 <b>CAM-2</b>	whoa. looks like it's movin' this way though.		
1131:54 <b>CAM-1</b>	yeah *.		
1131:55 <b>CAM-2</b>	***.		
1132:05 <b>CAM-1</b>	* just some lightning straight ahead.		
1132:11 <b>CAM-2</b>	*** think we're gonna be okay. right there.		
1132:15 <b>CAM-?</b>	*.		
1132:28 <b>CAM-1</b>	down the bowling alley.		
1132:44 <b>CAM-2</b>	as my friends would say, California cool.		
1132:48 <b>CAM-1</b>	cool.		
1132:49 <b>CAM-2</b>	[sound of chuckle]		
1132:51 <b>CAM-1</b>	peachy.		
1132:52 <b>CAM-2</b>	exactly.		
1133:46 <b>CAM-1</b>	that's forty miles.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1133:48 <b>CAM-2</b>	yeah.		
		1133:47 <b>CTR</b>	American fourteen twenty, contact Little Rock approach one three five point four.
		1133:53 <b>RDO-2</b>	thirty five four, American fourteen twenty. you have a good night.
		1133:55 <b>CTR</b>	good night.
		1134:03 <b>RDO-2</b>	American uh, fourteen twenty at uh, eleven three for ten thousand.
		1134:09 <b>APR</b>	American fourteen twenty, Little Rock approach roger. ah we have a thunderstorm just northwest of the airport moving uh, through the area now. wind is two eight zero at two eight, gusts four four and uh, I'll have new weather for you in just a moment I'm sure.
		1134:21 <b>RDO-2</b>	yeah we can see the uh, lightning and uh, you wanta repeat those winds again.
		1134:26 <b>APR</b>	right now the wind current wind is two niner zero at two eight, gusts four four.
1134:32 <b>CAM-1</b>	all right two eight zero at four four.		
1134:34 <b>CAM-2</b>	gusts to forty four *.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1134:36 <b>CAM-1</b>	right near the limit.		
1134:37 <b>CAM-2</b>	yeah, it's uh, forty degrees off. what's our cross(wind) *.		
1134:44 <b>CAM-1</b>	thirty.	1134:41 <b>APR</b>	American fourteen twenty expect an ILS runway two two left.
1134:48 <b>CAM-2</b>	no that's that's *, you're, not out of the limits because of the angle *, but it's pretty close.	1134:45 <b>RDO-2</b>	two two left, we've got that, fourteen twenty.
1134:54 <b>CAM-1</b>	yeah.		
1135:19 <b>CAM-2</b>	two two left is the right one.... so uh....		
1135:27 <b>CAM-2</b>	I uh, I didn't realize that.		
1135:30 <b>CAM-?</b>	eerraaw.	1135:35 <b>APR</b>	American fourteen twenty, descend at pilot's discretion. maintain four thousand.
		1135:38 <b>RDO-2</b>	* down to four thousand, American uh, fourteen twenty.

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1135:44 <b>CAM-1</b>	four thousand set.		
1135:48 <b>CAM-2</b>	okay, ten thousand foot, seatbelt sign no smoking.		
1135:50 <b>CAM</b>	[sound of "ding dong" similar to flight attendant call chime]		
1135:51 <b>CAM-1</b>	yeah I'll get down in a second *.		
1135:53 <b>CAM-2</b>	okay.		
1136:00 <b>CAM-2</b>	yeah it's ten knots uh...		
1136:02 <b>CAM-1</b>	thirty knots is the crosswind limitation but...		
1136:04 <b>CAM-1</b>	thirty knots is the.. wet, well.		
1136:06 <b>CAM-2</b>	that's the dry.		
1136:07 <b>CAM-1</b>	yeah, dry.		
1136:08 <b>CAM-2</b>	what about wet?		
1136:09 <b>CAM-1</b>	wet.		
1136:10 <b>CAM-2</b>	yeah.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1136:10 <b>CAM-1</b>	is twenty.		
1136:11 <b>CAM-2</b>	ah, it's twenty five. aw, what the #.		
1136:28 <b>PA-1</b>	flight attendants prepare for landing please.		
1136:38 <b>CAM-2</b>	you got the NOTAMS, with ya?		
1137:15 <b>CAM-2</b>	see the airport?		
1137:16 <b>CAM-1</b>	see it blinking out there.		
1137:18 <b>CAM-2</b>	** to the north,		
1137:18 <b>CAM-1</b>	straight ahead.		
1137:19 <b>CAM-2</b>	well there's a couple runways here so, the problem is we're sixteen miles south of the VOR and the airport's another five miles past that.		
1137:27 <b>CAM-1</b>	all right. (doesn't) matter.		
1137:30 <b>CAM-2</b>	so we've still got a little ways to go... bad part..... I'll tell you what. I'm gonna stay on the run... the VOR till we get a little closer.		
1138:20 <b>CAM-1</b>	oh I think I see, I see where it is.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1138:23 <b>CAM-2</b>	yeah it's on **.		
1138:24 <b>CAM-1</b>	it's straight up there, yeah...		
1138:25 <b>CAM-2</b>	* (blinking) *.		
1138:27 <b>CAM-1</b>	it looks like there's stratus a layer, right over there.		
1138:35 <b>CAM-2</b>	*** I definitely got **. (I'll show you this later).		
1138:53 <b>CAM-1</b>	he said there was a storm just northwest of the field?		
1138:55 <b>CAM-2</b>	he said northwest.		
1138:56 <b>CAM-1</b>	yeah.		
1138:57 <b>CAM-2</b>	lightning strike he said storm, uh.		
		1138:59 <b>APR</b>	American fourteen twenty, descend and maintain, three thousand.
		1139:02 <b>RDO-2</b>	out of four for three, American uh, fourteen twenty.
		1139:05 <b>APR</b>	American fourteen twenty uh, you're equipment's a lot better than uh, what I have. how 's the final for two two left lookin'?

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1139:11 <b>CAM-1</b>	what's that?	1139:11 <b>RDO-2</b>	okay, we can uh, see the airport from here. we can barely make it out but uh, we should be able to make two two. uh, that storm is moving this way like your, radar says it is but a little bit farther off than you thought.
1139:26 <b>CAM-1</b>	naw.	1139:22 <b>APR</b>	American fourteen twenty roger, would you just want to shoot a visual approach?
1139:37 <b>CAM-1</b>	whoa.	1139:27 <b>RDO-2</b>	uh, at this point we can't really make it out. we're gonna have to stay with you as long as possible.
1139:41 <b>CAM-1</b>	* thirty is a, tailwind though.	1139:31 <b>APR</b>	American fourteen twenty roger. and uh, the winds kinda kicked around a little bit right now. it's three three zero, at uh, one one.
		1139:38 <b>RDO-2</b>	okay, well that's a little bit, better than it was.
		1139:44 <b>APR</b>	*.

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1139:44 <b>APR</b>	and uh, right now I have a uh, windshear alert. the center field wind is three four zero at one zero north boundary wind is three three zero at two five. northwest boundary wind is zero one zero at one five.
1139:52 <b>CAM-?</b>	*.		
1139:55 <b>CAM-1</b>	** be landing on four?		
		1139:58 <b>RDO-2</b>	is there a possibility to get runway four?
		1140:00 <b>APR</b>	American fourteen twenty yes sir. we can do runway four if * you'd prefer that.
1140:04 <b>CAM-1</b>	it'd be a headwind.		
1140:05 <b>CAM-2</b>	yeah.		
1140:05 <b>CAM-2</b>	I think we're gonna need...		
		1140:07 <b>RDO-2</b>	...we would rather do the headwinds sir.
		1140:08 <b>APR</b>	I'm sorry, say again American fourteen twenty.
		1140:11 <b>RDO-2</b>	yeah, we're gonna want the headwind of course.... runway four.



## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1140:18 <b>CAM-1</b>	we're going to three, right?	1140:19 <b>APR</b>	American uh, fourteen twenty uh, turn right heading of uh, two five zero vectors for the ILS runway four right final approach course.
1140:21 <b>CAM-2</b>	yeah, three thousand.	1140:25 <b>RDO-2</b>	okay, a right turn to two five zero uh, the long way around?
1140:30 <b>CAM-1</b>	yeah right.	1140:28 <b>APR</b>	uh, yes sir, you're a little close to the airport.
1140:35 <b>CAM-2</b>	*, runway four.	1140:31 <b>RDO-2</b>	two five zero, that'll work.
1140:45 <b>CAM-2</b>	four right. one one one point three.... zero four two. I think we were, I think that was the airport right below us.		
1141:01 <b>CAM-1</b>	yeah it was. okay, one eleven three.		
1141:06 <b>CAM-2</b>	one eleven three. zero four two. four sixty on decision altitude.		
1141:13 <b>CAM-2</b>	four thousand for three thousand, is armed.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1141:15 <b>CAM-1</b>	okay.		
1141:18 <b>CAM-2</b>	uh, MSA is thirty three hundred feet all the way around.		
		1141:21 <b>APR</b>	American fourteen twenty uh, maintain three thousand three hundred for now please.
		1141:24 <b>RDO-2</b>	three thousand three hundred. we just saw it, thanks.
1141:27 <b>CAM-1</b>	yeah, the uh *.		
1141:30 <b>CAM-2</b>	okay. and two two seventeen glide slope intercept all the way down missed approach right turn to four thousand.... ***.		
1141:56 <b>CAM-2</b>	let's see, you got the airport? tell you what. *.		
1141:59 <b>CAM-1</b>	yeah. ** I don't have the airport.		
1142:02 <b>CAM-2</b>	**, I'm saying you got the ILS.		
1142:03 <b>CAM-1</b>	yeah, I got the ILS		
1142:06 <b>CAM-1</b>	it's uh...		
1142:12 <b>CAM-2</b>	yeah, there it is. I got the airport.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1142:15 <b>CAM-1</b>	okay, and decision height is four sixty.		
1142:16 <b>CAM-2</b>	yeah.		
1142:18 <b>CAM-1</b>	do you have the airport?		
1142:19 <b>CAM-2</b>	*		
1142:19 <b>CAM-1</b>	is that it right there?		
1142:20 <b>CAM-?</b>	okay.		
1142:22 <b>CAM-2</b>	* see, I can't		
1142:23 <b>CAM-1</b>	I don't see a runway.		
1142:25 <b>CAM-2</b>	go out this way.		
		1142:26 <b>APR</b>	American fourteen twenty, it appears we have uh, second part of this storm moving through. the winds now, three four zero at one six, gusts three four.
1142:33 <b>CAM-1</b>	okay.		
		1142:34 <b>RDO-2</b>	roger that.

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1142:39 <b>CAM-2</b>	you wanna accept a short approach? want to keep it in tight?		
1142:41 <b>CAM-1</b>	yeah, if you see the runway. 'cause I don't quite see it.		
1142:44 <b>CAM-2</b>	yeah, it's right here, see it?		
1142:47 <b>CAM-1</b>	[sound of grunt] you just point me in the right direction and I'll start slowing down here. give me flaps eleven.		
		1142:53 <b>RDO-2</b>	and uh...
1142:54 <b>CAM-2</b>	#, it's going right over the... f-field.		
1142:54 <b>CAM-1</b>	*.		
		1142:55 <b>APR</b>	American fourteen twenty, did you call me?
		1142:58 <b>RDO-2</b>	well we got the airport. we're going between clouds. I think it's right off my uh, three o'clock low, about four miles.
		1143:04 <b>APR</b>	American fourteen twenty, that's it. do you wanna shoot the visual approach or you wanna go out for the ILS?
		1143:08 <b>RDO-2</b>	I can, we'll, we'll (start) the visual. if we we can do it.

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1143:11 <b>APR</b>	American fourteen twenty's cleared visual approach runway four right. if you lose it, need some help. let me know please.
		1143:15 <b>RDO-2</b>	I'll stay with you as long as possible, OK?
		1143:18 <b>APR</b>	that's fine, I'm working everything, American fourteen twenty.
		1143:20 <b>RDO-2</b>	that works for me.
		1143:21 <b>APR</b>	all right.
1143:23 <b>CAM-1</b>	well you keep me straight.		
1143:23 <b>CAM-2</b>	keep it right here, keep it right here, ** right here.		
1143:25 <b>CAM-1</b>	what?		
1143:26 <b>CAM-2</b>	okay, did you notice something? there's the airport right there. okay?		
1143:31 <b>CAM-1</b>	where?		
1143:31 <b>CAM-2</b>	okay, you're set up on a base for it. okay?		
1143:33 <b>CAM-1</b>	I'm on a base now?		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1143:35 <b>CAM-2</b>	well, you're on a dogleg. you're comin' in. there's the airport.		
1143:38 <b>CAM-1</b>	uh, I lost it.		
1143:39 <b>CAM-2</b>	right there, you're you're downwind. see it's right there.		
1143:44 <b>CAM-1</b>	I still don't see it. [sound of chuckle] well just vector me. I don't know.		
1143:47 <b>CAM-2</b>	okay, well just go * right here.		
1143:49 <b>CAM-1</b>	okay.		
		1143:59 <b>APR</b>	American fourteen twenty, you can monitor one one eight point seven, runway four right, cleared to land. the wind right now three three zero at two one.
		1144:05 <b>RDO-2</b>	eighteen seven, we'll monitor, American fourteen twenty, thanks. cleared to land runway four.
1144:10 <b>CAM-1</b>	*****.		
1144:13 <b>CAM-2</b>	if you look at ....		
1144:14 <b>CAM-1</b>	those red lights out there. where, where's that in relation to....		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1144:18 <b>CAM-2</b>	there's another, there's two runways here. there's three runways.		
1144:19 <b>CAM-1</b>	yeah I know. see we're losing it. I don't think we can maintain visual.		
1144:22 <b>CAM-2</b>	** yeah.		
		1144:23 <b>RDO-2</b>	hold on and uh.....
1144:26 <b>CAM-1</b>	oh, you're on tower.		
1144:27 <b>CAM-2</b>	oh, I'm sorry.		
		1144:28 <b>RDO-2</b>	and approach American fourteen twenty.
		1144:29 <b>APR</b>	American fourteen twenty, yes sir.
		1144:30 <b>RDO-2</b>	and there's a cloud between us and the airport. we just lost the field and I'm uh, on this vector here, I have the uh, basically last vector you gave us, we're on kind of a dog leg it looks like.
		1144:39 <b>APR</b>	American fourteen twenty, can you fly heading two two zero? I'll take you out for the ILS.
1144:42 <b>CAM-1</b>	**.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1144:43 <b>RDO-2</b>	yeah two two zero's fine.
		1144:45 <b>APR</b>	and it will be just one probably one turn on from uh, downwind to final, for the ILS.
		1144:49 <b>RDO-2</b>	'K that's how it's gonna have to be, thanks.
1144:51 <b>CAM-2</b>	yeah, I had it but I lost it with the clouds and that's what I was saying.		
1144:54 <b>CAM-1</b>	okay.		
		1144:54 <b>APR</b>	American fourteen twenty, descend and maintain two thousand three hundred.
		1144:56 <b>RDO-2</b>	two thousand three hundred, American fourteen twenty.
1144:59 <b>CAM-2</b>	two thousand three hundred.		
1145:00 <b>CAM-1</b>	set and armed. uh, now it is.		
1145:07 <b>CAM-2</b>	#, * we had it.		
1145:09 <b>CAM-1</b>	yeah. I just, I never saw the runway.		
1145:11 <b>CAM-2</b>	no no, it's okay. I **.		



## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1145:12 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1145:13 <b>CAM-5</b>	stabilizer motion		
1145:15 <b>CAM-1</b>	I hate droning around visual at night in weather without, having some clue where I am.		
1145:23 <b>CAM-2</b>	yeah but, the longer we go out here the ...		
1145:24 <b>CAM-1</b>	yeah, I know.		
1145:25 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1145:26 <b>CAM-5</b>	stabilizer motion.		
1145:29 <b>CAM-2</b>	see how we're going right into this crap.		
1145:31 <b>CAM-1</b>	right.		
		1145:47 <b>RDO-2</b>	and approach American fourteen twenty, I know you're doing your best sir. we're getting pretty close to this storm. we'll keep it tight if we have to.
		1145:52 <b>APR</b>	* American fourteen twenty uh, turn right heading of uh, two seven zero.
1145:56 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1145:57 <b>RDO-2</b>	two seven zero, American fourteen twenty.
		1145:59 <b>APR</b>	and uh, when you join the final, you're going to be right at just a little bit outside the marker if that's gonna be okay for ya.
1146:04 <b>CAM-1</b>	that's great.		
		1146:05 <b>RDO-2</b>	that's great with us.
		1146:06 <b>APR</b>	American fourteen twenty, roger.
1146:11 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1146:11 <b>CAM-2</b>	see we're right on the base of these clouds so ...		
1146:13 <b>CAM-1</b>	yeah.		
1146:14 <b>CAM-2</b>	... it's not worth it.		
1146:15 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1146:20 <b>CAM-2</b>	two seven zero, two thousand three hundred?		
1146:23 <b>CAM-1</b>	yes sir. * where I am.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1146:25 <b>APR</b>	American fourteen twenty, turn right heading three, zero zero.
		1146:29 <b>RDO-2</b>	right turn three zero zero American fourteen twenty.
		1146:39 <b>APR</b>	American fourteen twenty is uh, three miles from the marker. turn right heading zero two zero. maintain two thousand three hundred 'til established on the localizer. cleared ILS runway four right approach.
1146:43 <b>CAM</b>	[brief sound of Morse Code identifier]		
		1146:47 <b>RDO-2</b>	zero two zero 'til established, American fourteen twenty, cleared four left approach.
1146:52 <b>CAM-1</b>	aw, we're goin' right into this.		
		1146:52 <b>APR</b>	American fourteen twenty, right now we have uh, heavy rain on the airport. the uh, current weather on the ATIS is not correct. I don't have new weather for ya, but the uh, visibility is uh, less than a mile. runway four right RVR is three thousand.
1146:53 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1147:04 <b>CAM-1</b>	three thousand.		
		1147:04 <b>RDO-2</b>	roger that, three thousand, American uh, fourteen twenty. this is four right, correct?

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1147:07 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]	1147:08 <b>APR</b>	American fourteen twenty, that's correct sir. and runway four right, cleared to land. the wind three five zero at three zero, gusts four five.
1147:10 <b>CAM-1</b>	can we land?	1147:16 <b>RDO-2</b>	zero three zero at four five, American fourteen twenty.
1147:19 <b>CAM-2</b>	** zero forecast right down the runway.		
1147:22 <b>CAM-1</b>	three thousand RVR. we can't land on that.		
1147:24 <b>CAM-2</b>	three thousand if you look at uh...		
1147:26 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1147:27 <b>CAM-1</b>	what do we need?		
1147:28 <b>CAM-2</b>	no it's twenty four hundred RVR.		
1147:29 <b>CAM-1</b>	okay, fine.		
1147:30 <b>CAM-2</b>	yeah, we're doing fine.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1147:31 <b>CAM-1</b>	all right.		
1147:34 <b>CAM-1</b>	uh, fifteen.		
1147:36 <b>CAM</b>	[sound of clicks similar to flap handle movement]		
1147:40 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1147:44 <b>CAM-1</b>	llanding gear down.		
1147:46 <b>CAM</b>	[sound similar to landing gear being operated]		
1147:47 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1147:49 <b>CAM-1</b>	and lights ** please.		
1147:51 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1147:52 <b>CAM-5</b>	stabilizer motion		
		1147:53 <b>APR</b>	windshear alert, center field wind, three five zero at three two, gusts four five. north boundary wind three one zero at two niner. northeast boundary wind three two zero at three two.
1148:02 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1148:03 <b>CAM-5</b>	stabilizer motion.		
1148:04 <b>CAM-2</b>	flaps twenty eight?		
1148:11 <b>CAM-1</b>	add twenty.		
1148:13 <b>CAM-2</b>	right.		
1148:13 <b>CAM-1</b>	add twenty knots.		
1148:15 <b>CAM-2</b>	okay.		
		1148:13 <b>APR</b>	American fourteen twenty, the runway four right RVR now is one thousand six hundred.
1148:18 <b>CAM-2</b>	aw #.		
1148:19 <b>CAM-1</b>	well we're established on the final.		
1148:21 <b>CAM-2</b>	we're established we're inbound, right.		
		1148:25 <b>RDO-2</b>	okay, American fourteen twenty, we're established inbound.

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1148:27 <b>APR</b>	American fourteen twenty roger, runway four right, cleared to land, and the wind, three four zero at three one. north wind, north uh, boundary wind is three zero zero at two six, north-east boundary wind three two zero at two five, and the four right RVR is one thousand six hundred.
1148:37 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
		1148:42 <b>RDO-2</b>	American uh, fourteen twenty, thanks.
1148:44 <b>CAM-2</b>	that's a good point.		
1148:46 <b>CAM</b>	[unidentified intermittent tone]		
1148:48 <b>CAM-2</b>	keep the speed.		
1148:51 <b>CAM-2</b>	thousand feet.		
1148:55 <b>CAM-1</b>	I don't see anything. lookin' for four sixty.		
1148:59 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1149:01 <b>CAM-2</b>	it's there.		
1149:03 <b>CAM-2</b>	want forty flaps?		
1149:05 <b>CAM-1</b>	oh yeah, thought I called it.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1149:06 <b>CAM-2</b>	forty now. thousand feet. twenty, forty forty land.		
1149:11 <b>CAM</b>	[unidentified tone similar to sound at time 2928]		
1149:13 <b>CAM-1</b>	this is, this is a can of worms.		
		1149:11 <b>APR</b>	wind is three three zero at two eight.
1149:18 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1149:23 <b>CAM</b>	[sound similar to stabilizer-in-motion horn]		
1149:25 <b>CAM-1</b>	(I'm gonna stay above it a little)		
1149:25 <b>CAM-2</b>	there's the runway off to your right, got it?		
1149:27 <b>CAM-1</b>	no.		
1149:28 <b>CAM-2</b>	I got the right runway in sight.		
1149:31 <b>CAM-2</b>	you're right on course. stay where you're at.		
1149:32 <b>CAM-1</b>	I got it, I got it.		



## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1149:33 <b>APR</b>	wind three three zero at two five.
1149:38.6 <b>CAM-?</b>	wiperssss.		
1149:42.3 <b>CAM</b>	[sound similar to windshield wiper motion]		
1149:47.3 <b>CAM-2</b>	five hundred feet.		
1149:51.0 <b>CAM-?</b>	*.		
1149:54.6 <b>CAM-1</b>	plus twenty.		
		1149:54 <b>APR</b>	wind three two zero, at two three.
1149:57.5 <b>CAM-?</b>	aw #, we're off course.		
1149:58.5 <b>CAM-?</b>	**.		
1150:01.4 <b>CAM-2</b>	we're way off.		
1150:02.5 <b>CAM-1</b>	I can't see it.		
1150:05.4 <b>CAM-2</b>	got it?		
1150:06.1 <b>CAM-1</b>	yeah I got it.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1150:08.9 <b>CAM-2</b>	hundred feet.		
1150:10.4 <b>CAM-?</b>	above.		
1150:12.1 <b>CAM-2</b>	hundred.		
1150:14.66 <b>CAM-2</b>	fifty.		
1150:13.75 <b>CAM-5</b>	sink rate.		
1150:15.5 <b>CAM-2</b>	forty.		
1150:15.16 <b>CAM-5</b>	sink rate.		
1150:16.8 <b>CAM-2</b>	thirty.		
1150:18.6 <b>CAM-2</b>	twenty.		
1150:19.3 <b>CAM-2</b>	ten.		
1150:21.2 <b>CAM</b>	[sound of two thuds similar to aircraft touching down on runway concurrent with unidentified squeak sound]		
1150:23.2 <b>CAM-2</b>	we're down.		
1150:25.4 <b>CAM-2</b>	we're sliding.		

## INTRA-COCKPIT COMMUNICATION

## AIR-GROUND COMMUNICATION

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1150:27.1 <b>CAM-1</b>	#... #.		
1150:32.9 <b>CAM-?</b>	on the brakes.		
1150:34.2 <b>CAM-?</b>	oh sh ...		
1150:34.6 <b>CAM</b>	[sound similar to increase in engine RPM]		
1150:36.2 <b>CAM-?</b>	other one, other one, other one.		
1150:42.0 <b>CAM-?</b>	aw #.		
1150:42.7 <b>CAM-?</b>	##.		
1150:44.9 <b>CAM</b>	[sound of impact]		
1150:45.4 <b>CAM-?</b>	##.		
1150:48.0 <b>CAM</b>	[sound of several impacts]		
1150:49.1 <b>END of RECORDING</b> <b>END of TRANSCRIPT</b>			

**NATIONAL TRANSPORTATION SAFETY BOARD**  
Vehicle Recorders Division  
Washington, D.C. 20594

August 27, 1999

## **Cockpit Voice Recorder Flight Test**

**Group Chairman's Factual Report**  
by **Albert G. Reitan**

### **A. ACCIDENT**

Location: Little Rock Adams Airport, Arkansas  
Date: June 1, 1999  
Time: 1150 PM central daylight time (CDT)  
Aircraft: American Airlines, flight 1420, McDonnell Douglas MD-82  
N215 AA  
NTSB Number: DCA99MA060

### **B. SUMMARY**

The Cockpit Voice Recorder (CVR) group could not detect any sounds on the accident flight CVR recording consistent with the arming or deployment of the automatic ground spoiler system. Two flight tests were then conducted on August 27, 1999 to determine if it is possible to detect these sounds on a CVR recording.

### **C. DETAILS OF INVESTIGATION**

Both tests were conducted on revenue passenger flights piloted by two American Airlines captain check airmen. In each case the airplane was equipped with a CVR model A-100A similar to the one on the accident flight. The only variance from standard American Airlines procedure was that the non-flying pilot verbally confirmed the arming and deployment of the automatic ground spoiler system during the approach and landing phase of the flight. A video recording was made of both tests to provide a back-up recording.

The first test was conducted on American flight 1829, DCA – ORD, MD-82 aircraft number N5013AA. The second was conducted on American flight 154, ORD – DCA, MD-82 aircraft number N516AM. On the second test, the captain attempted to very slowly arm the spoiler handle to provide minimum noise. Regardless, a definite “snap” was recorded on the cockpit area channel as the spoiler handle was lifted during the arming process.

After each flight, the CVR recorder was removed from the aircraft to preserve the CVR recording. Both recorders were then taken to the audio laboratory of the National Transportation Safety Board.

Both tests revealed that the ground spoiler arming and automatic deployment could be clearly heard on the CVR recordings.

*[original signed]*

Albert G. Reitan  
Transportation Safety Specialist (CVR)