NATIONAL TRANSPORTATION SAFETY BOARD Engineering & Computer Services Division Washington, D.C. 20594



SPECIALIST'S FACTUAL REPORT OF INVESTIGATION Cockpit Voice Recorder DCA96RA020

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

Office of Research and Engineering Washington, D.C. 20594

March 21, 1996

Cockpit Voice Recorder

Group Chairman's Factual Report by Albert G. Reitan

A. **ACCIDENT**

Location:

Buga, Colombia

Date: Time: December 20, 1995

2142 local standard time

Aircraft:

American Airlines Flight 965, B-757-223, N651AA

NTSB Number:

DCA96RA020

B. **GROUP**

Chairman:

Albert G. Reitan

Transportation Safety Specialist (CVR) National Transportation Safety Board

Member:

Captain German Duarte P.

Unidad Administrativa Especial

Aeronautica Civil

Republica De Colombia

Member:

Larry G. Smith

Air Safety Investigator

Federal Aviation Administration

Member:

Captain Leon E. Robert

Senior Project Pilot

Boeing Commercial Airplane Group

Member:

Captain Tom McBroom Chief Technical Pilot American Airlines

Member:

Robert W. Bowen

National Safety Committee Allied Pilots Association

C. SUMMARY

A Fairchild model A-100A cockpit voice recorder (CVR), s/n 59225, was brought to the audio laboratory of the National Transportation Safety Board on December 23, 1995. The Cockpit Voice Recorder committee convened on December 23, 1995. A transcript was prepared of the entire 30:40 minute recording. (attached)

D. DETAILS OF INVESTIGATION

The exterior of the CVR showed some evidence of structural damage. The rear of the outer casing was slightly dented. Part of the mounting bracket was still attached. It was necessary to cut away the exterior case to access the memory module. There was no evidence of heat or smoke damage to the exterior casing.

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.

Timing on the CVR transcript was initially established using an ATC transcript provided by the Colombian government. At a later date, a second ATC transcript with updated, more accurate timing, was provided by the Colombian government. The events on the second ATC transcript occur three minutes and forty two seconds later than those on the first ATC transcript. Times from the second ATC transcript were used as the time reference in the attached CVR transcript. The elapsed time between events is unchanged.

The recording started at 2112:29 Colombian local time and continued uninterrupted until 2141:28 when electrical power was removed from the unit. When the recording started, the flight was at cruise altitude. The recording continued as the crew commenced the descent for approach to the Cali airport. The recording ended when the aircraft collided with terrain.

Albert C. Paller

Albert G. Reitan
Transportation Safety Specialist (CVR)

Attachments:

Transcript of a Fairchild A-100A cockpit voice recorder (CVR), s/n 59225, installed on an American Airlines Boeing B-757, N651AA, which was involved in a collision with terrain near Buga, Colombia, South America, on December 20, 1995.

LEGEND

нот	Crewmember hot microphone voice or sound source
RDO	Radio transmission from accident aircraft
CAM	Cockpit area microphone voice or sound source
BOG	Radio transmission from Bogota center
APR	Radio transmission from Cali approach control
OPS	Radio transmission from American Airlines Cali operations
UNK	Radio transmission received from unidentified aircraft
PA	Transmission made over aircraft public address system
-1	Voice identified as Pilot-in-Command (PIC)
-2	Voice identified as Co-Pilot
-4	Voice identified as aircraft mechanical voice
-?	Voice unidentified
*	Unintelligible word
@	Non pertinent word
#	Expletive
%	Break in continuity
()	Questionable insertion
[]	Editorial insertion
	Pause

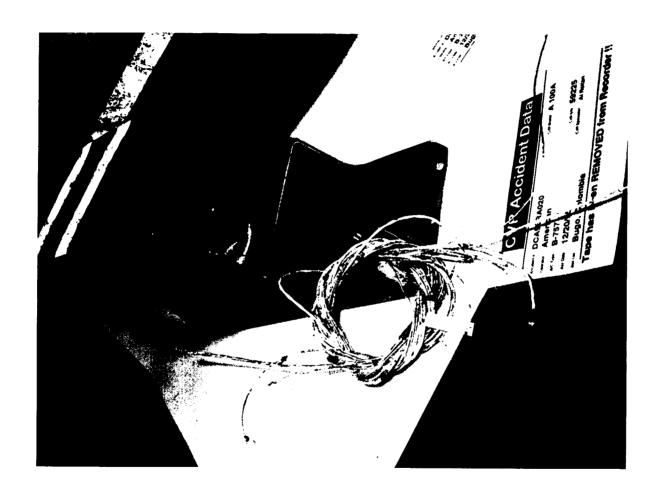
Note: Times are expressed in Colombia local time.

DCA96RA020 AA965 Buga, Colombia 12/20/95



Front view of Cockpit Voice Recorder before disassembly

DCA96RA020 AA965 Buga, Colombia 12/20/95



Rear view of Cockpit Voice Recorder before disassembly

AIR-GROUND COMMUNICATION

TIME &		TIME &		
SOURCE	CONTENT	SOURCE	CONTENT	

START of RECORDING

START of TRANSCRIPT

2112:29 CAM-1	alright quickly if I can get in there. if not, I'll be right back.
2119:20 CAM	[click similar to cockpit door being operated]
2119:30 CAM-1	any messages?
2119:31 HOT-2	well we did get the weather, it's good.
2119:33 CAM-1	alright.
2119:40 CAM-1	she's claiming they they get an extra, twenty minutes.
2119:46 HOT-2	an extra twenty minutes, for what?
2119:49 CAM-1	debri, it's, it's difficult with the language problem, but

AIR-GROUND COMMUNICATION

CONTENT

TIME & Source	CONTENT	TIME & SOURCE
2119:55 CAM-1	umm, according to her figures, they're not airport till eight fifty. if we get in at ten o'clock about ten o'clock, * round it out. eight fifty departure. she says it's their legality. so I s the case maybe what we'll do is we'll go, lea fifty, get to the airport at nine twenty, and d and that * roughly the plan right now. I wan have to say about, cause she says their dut ferent than ours. first she said they have a brief which would have been fifteen extra resaid, they needed twenty extra minutes, racause I don't know where the hell she's conbut anyway. with this stuff, you're not now # over your crew, but you really have to wo FAAwise, because	ck, now I'm figuring for a nine fifty, aid well OK, if that's eve the hotel at eight epart at nine fifty. It to see what they y rigs are slightly dif- forty five minute de- minutes, then she ther than a half hour, min' up with that t only worried about
2121:02 HOT-2	yeah.	
2121:03 CAM-1	if you don't have your legal rest you hat there?	ve the new rigs
2121:07 HOT-2	I got this little chart but	
2121:08 CAM-1	well you see what you come up with. I'll wa the radio, OK?	tch the airplane and
2121:11 HOT-2	OK.	
2121:50 HOT-2	all I see on this little chart they handed out, it's not	is on duty time but

TIME & Source	CONTENT	TIME & Source	CONTENT	
2121:56 CAM-1	that's another very confusing thing, that			
2121:59 HOT-2	but it doesn't say anything about rest period.			
2122:02 CAM-1	I started to say, I wrote this little sheet out, I called day and I said hey, this # international is doing me understand two man crew blah, blah, blah, it varies crew, three man I said, I want you to spell out the and that's where I got this from. and I wrote it dow itly. ten hours minimum crew rest.	, and I don't s two man e legal rest,		
2122:28 HOT-2	that's on international?			
2122:29 CAM-1	yeah, if you fly less than five and a half hours.			
2122:32 HOT-2	which this case			
2122:33 CAM-1	that's our scenario. ten hours crew rest, thirty min and one hour sign in. and you can't move that up cause it's an FAA thing. you roll those wheels, be and a half hours, you're #. now, now, like I say. I comply you know, grab a little extra half hour for us. we'll bit late. just give us a little extra sleep time. as lor the thing off at nine fifty so we don't get, get our a # didn't you report. to which I will say, the thirty for cab ride each way I don't think we had enough leg now if you want to hang me on that you hang me odidn't break any FAA regulations anyway you know	at all, be- efore eleven can, I'll have report a little ag as we get css **, why the rty minute # ial safe time on that but I		

TIME & Source	CONTENT	TIME & Source	CONTENT	
2123:32 CAM-1	when you want descent, let me know a few minutes early in case there's a language problem, OK?	1		
2123:37 HOT-2	sure.			
2123:38 CAM-1	I can get through.			
2123:45 HOT-1	now, I'll attempt the company here the next few minutes, go little bit closer.	et a		
2124:12 HOT-2	yeah, see this is about the right length trip. it feels like it's about time to land now			
2124:15 HOT-1	yep.			
2124:18 HOT-2	you know we're on these eight and a half hour deals *.			
2124:19 HOT-1	too much.			
2124:19 HOT-2	* miserable the last four hours.			
2124:21 HOT-1	I am. I don't know how some guys do it so much. you know	ı **?		
2124:25 HOT-2	yeah, I flew with *.			

TIME & Source	CONTENT	TIME & SOURCE	CONTENT	
2124:26 HOT-1	yeah * a friend of mine. I played tennis, with him used to fly that Sao Paulo and all of that # all the tin know in * last five years and, and all that, # * you're self doin' that #. you really need that extra couple bucks, a month or whatever it comes to retirement' uh to each his own. but he said he didn't mind it mind driving back home at five o'clock in the morni I'm like	ne well you # killin' your- hundred ? but anyway ;, he didn't		
2124:58 HOT-2	yeah.			
2125:00 HOT-1	it's torture.			
2125:01 HOT-2	yeah.			
2125:02 HOT-1	torture in the # car, trying to keep awake and stay a discussed this with my wife, I said honey I just don' this, I hope you don't feel like I'm *. she said no wa she said, you don't need to do that #.	t want to do		
2125:20 HOT-1	[sound similar to yawn]			
2125:23 HOT-1	yeah, * just retired a couple weeks ago.			
2125:25 HOT-2	yeah, I knew this was his last month.			
2125:27 HOT-1	yeah. he's a good man. I like *. we're good friend	s.		

TIME & SOURCE	CONTENT	TIME & Source	CONTENT
2125:31 HOT-2	he got robbed at knife point in Rio, wasn't it?		
2125:33 HOT-1	that's right. he got stuck a little bit actually too.		
2125:40 HOT-2	well let's see, we got a hundred and thirty six miles to the and thirty two thousand feet to lose, and slow down to we might as well get started.		
2125:49 HOT-1	alright sir.		
2126:01 HOT-1	and if if you'd keep the speed up in the descent, I'd, it help us too, OK?	would	
2126:04 HOT-2	OK.		
	•	2126:16 RDO-1	Bogota, American nine six five request descent.
		2126:20 BOG	American nine six five, descend and maintain flight level two four zero, report reaching.
		2126:26 RDO-1	OK, we're leaving three seven zero. descend and maintain two four zero, twenty four. thank you ma'am. American nine six five.
		2126:33 BOG	that's correct.
2126:35 HOT-2	twenty four set.		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
2126:35 HOT-1	yes sir.		
2126:40 HOT-1	I'm goin' to call the company.		
2126:42 HOT-2	OK.		
		2126:42 RDO-1	American airlines operations at Cali, this is American nine six five, do you read?
		2126:49 OPS	go ahead American nine six five, this is Cali ops.
·		2126:51 RDO-1	alright Cali. we will be there in just about twenty five min- utes from now eeh, and go ahead the weather.
		2127:00 OPS	OK sir, the the change over, the temperature is twenty * degrees. the altimeter, the (QNH) is two nine point nine eight. conversion is two six point seven one.
		2127:18 RDO-1	OK, understand the weather is good. twenty three degrees, two nine nine eight. two six seven one. is that correct?
		2127:24 OPS	that's correct.
		2127:25 RDO-1	OK, are we parking at gate two tonight?

TIME & Source	CONTENT	TIME & Source	CONTENT
		2127:28 OPS	gate two and uh runway (zero) one.
		2127:32 RDO-1	runway zero one roger and the weather is good, huh?
		2127:34 OPS	OK captain.
		2127:36 RDO-1	see you on the ground, nine six five.
2127:39 HOT-1	two nine nine eight, two six seven one. that sounds about right, let's see. three twenty six. nine nine eight, three two is two seven six, uh, right on the money. OK, that's good. uhhhh, the weather's good. runway one, gate two.	six	
2127:58 HOT-2	alright. ***		
2127:59 HOT-1	alright baby.		
2127:59 HOT-2	sounds good.		
2128:00 HOT-1	alright.		
2128:05 HOT-1	and I'm gonna put the headlights on early here because the a lot of VFR and who knows what good deal. so the headlight just help us a little bit.		
2128:23 HOT-1	and also what was that position was five? we're just about it, aren't we?	t at	

TIME & Source	CONTENT	TIME & SOURCE	CONTENT
2128:27 HOT-2	yeah. forty seven north of Rio Negro uh, 'course we to Rio Negro.	didn't go	
2128:33 HOT-1	sorry?		
2128:35 HOT-2	talking about the uh		
2128:36 HOT-1	yeah, it was Rio Negro plus forty seven I think		
2128:38 HOT-2	Rio Negro plus forty seven.		
2128:39 HOT-1	what's, what they show lat long?		
2128:41 HOT-2	well, let me find it.		
2128:42 HOT-1	just out of curiosity, five something.		
2128:45 HOT-2	I had the flight plan		
2128:46 HOT-1	alright, * I wouldn't worry about it.		
2128:56 HOT-2	there we go.		
2128:57 HOT-2	north uh, zero five one four six. four, so zero five for	rty one	

TIME & Source	CONTENT	TIME & Source	CONTENT	
2129:00 HOT-1	we're passed it. OK, we're passed it, we press on,	right?		
2129:04 HOT-2	right.			
2129:15 HOT-1	I'm going to talk to the people.			
2129:17 HOT-2	OK.			
2129:18 HOT-1	I'm off.			
2129:23 PA-1	uh ladies and gentlemen, this is captain Tafuri, we our descent for landing at Cali. it's a lovely evening expected. we'll pass a shower or two on the way in the field right now it's uh, good visibility, the tempe three, that's twenty three degrees Celsius, and if y Fahrenheit, that's seventy two degrees on the Falscale. the winds are ten miles an hour from the not a very very pretty evening. I'd like to thank everyoing with us. again, I apologize for, being late tonighthings do happen sometimes, very frustrating but very much we could do about it. again I appreciate tience in the matter. like to wish everyone a very very holiday, and a healthy and prosperous nineteen not thank you for coming with us.	as we had but uh, at rature is two rou prefer renheit th west. it's ne for com- it. these there wasn't your pa- ery happy		
2130:14 HOT-1	I'm back.			
2130:28 HOT-2	uh I may have to slow down if it gets too rough.			

TIME & Source	CONTENT	TIME & SOURCE	CONTENT
2130:30 HOT-1	sure.	,	
2131:08 HOT-1	you want any of these nuts, Don?		
2131:09 HOT-2	no thank you.		
2131:11 HOT-1	you want me to call for the water or do you want to wait till we get on the ground, 'bout your water?		
2131:14 HOT-2	oh, I'll get it on the ground.		
2131:22 HOT-2	one to go.		
2131:25 HOT-1	aye, aye.		
2131:29 HOT-1	you got the engine heat off good.		
		2131:53 RDO-1	American nine six five is level two four zero.
		2132:11 RDO-1	American nine six five is level two four zero.
		2132:13 BOG	standby two minutes for lower.
2132:21 HOT-1	pretty night, huh?		

TIME & Source_	CONTENT	TIME & Source	CONTENT
2132:23 HOT-2	yeah it is, lookin' nice out here.		
2133:25 HOT-2	let's see, what is the transition level here?		
2133:28 HOT-1	oh yeah, it's a good check.		
2133:32 HOT-2	eighteen thousand?		
2133:33 HOT-1	one ninety, eighteen thousand, yeah.		
2133:40 HOT-2	well if she doesn't let us down in a little while, she's goin' to me in a jam here.	put	
		2133:50 RDO-1	and American nine six five, request lower.
		2133:53 BOG	American nine six five. * descend to flight level two zero zero. report leaving two four zero.
		2133:59 RDO-1	we're leaving two four zero now and descending to two zero zero.
2134:03 HOT-2	it's set.		
		2134:04 BOG	call Cali frequency one one niner decimal one. buenos noches.

TIME & Source	CONTENT	TIME & Source	CONTENT
		2134:07 RDO-1	please say the frequency again.
		2134:09 BOG	one one niner decimal one.
		2134:13 RDO-1	one one niner decimal one. feliz navidad seniorita.
		2134:15 BOG	muchas gracias, lo mismo.
		2134:19 RDO-1	gracias.
		2134:22 RDO-1	center, American nine six five, leaving flight level two four zero descending to two zero zero. buenos tardes.
2134:37 HOT-2	nineteen one or		
2134:39 HOT-1	that's Cali.		
		2134:40 RDO-1	Cali approach, American nine six five.
		2134:44 APR	American niner six five, good evening. go ahead.
		2134:47 RDO-1	ah, buenos noches senior, American nine six five leaving two three zero, descending to two zero zero. go ahead sir.
		2134:55 APR	the uh, distance DME from Cali?

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
	·	2134:57 RDO-1	the DME is six three.
		2134:59 APR	roger, is cleared to Cali VOR, uh, descend and maintain one, five thousand feet. altimeter three zero zero two
2135:09 HOT-2	one five.		
		2135:09 APR	no delay expect for approach. report uh, Tulua VOR.
		2135:14 RDO-1	OK, understood. cleared direct to Cali VOR. uh, report Tulua and altitude one five, that's fifteen thousand three zero zero two. is that all correct sir?
		2135:25 APR	affirmative.
		2135:27 RDO-1	thank you.
2135:28 HOT-1	I put direct Cali for you in there.		
2135:29 HOT-2	OK, thank you.		
2135:44 HOT-2	two fifty below ten here?		
2135:47 HOT-1	yeah.		

TIME & Source	CONTENT	TIME & Source	CONTENT
2136:18 CAM	[sound of single chime similar to seat belt switch being activated]		
2136:20 PA-1	uh, flight attendants please prepare for landing, thank you.		
2136:24 HOT-1	I sat 'em down and		
		2136:27 APR	* niner six five, Cali.
2136:28 PA-1	niner.		
		2136:29 RDO-1	niner six five, go ahead please.
		2136:31 APR	* sir the wind is calm. are you able to approach runway one niner.
2136:36 HOT-1	would you like to shoot the one nine straight in?		
2136:38 HOT-2	uh yeah, we'll have to scramble to get down. we can do it.		
		2136:40 RDO-1	uh yes sir, we'll need a lower altitude right away though.
		2136:43 APR	roger. American nine six five is cleared to VOR DME approach runway one niner. Rozo number one, arrival. report Tulua VOR.

TIME & Source	CONTENT	TIME & Source	CONTENT
		2136:52 RDO-1	cleared the VOR DME to one nine, Rozo one arrival. will report the VOR, thank you sir.
		2136:58 APR	report uh, Tulua VOR.
		2137:01 RDO-1	report Tulua.
2137:03 HOT-1	I gotta give you to Tulua first of all. you, you wanna go right t Cal, er to Tulua?	to	
2137:09 HOT-2	uh, I thought he said the Rozo one arrival?		
2137:10 HOT-1	yeah he did. we have time to pull that out(?)		
2137:11 CAM	[sound similar to rustling pages]		
2137:12 HOT-1	and, Tulua one Rozo there it is.		
2137:25 HOT-1	yeah, see that comes off Tulua.		
2137:27 HOT-2	OK.		
		2137:29 RDO-1	can American airlines uh, nine six five go direct to Rozo and then do the Rozo arrival sir?

TIME & Source	CONTENT	TIME & Source	CONTENT
		2137:36 APR	affirmative. take the Rozo one and runway one niner, the wind is calm.
		2137:42 RDO-1	alright Rozo, the Rozo one to one nine, thank you, American nine six five.
		2137:46 APR	(thank you very much) report Tulua and eeh, twenty one miles, ah, five thousand feet.
		2137:53 RDO-1	OK, report Tulua twenty one miles and five thousand feet, American nine uh, six five.
2137:59 HOT-2	OK, so we're cleared down to five now?		
2138:01 HOT-1	that's right, and off Rozo which I'll tune here.		
2138:26 HOT-1	see what I get		
2138:27 HOT-2	yeah.		
2138:28 HOT-1	at twenty one miles at five thousand's part of the approach OK?	h.	
2138:31 HOT-2	OK.		
2138:33 HOT-1	off ULQ, so let me put ULQ in here, seventeen seven caus want to be on raw data with you.	e I	

TIME & Source	CONTENT	TIME & Source	CONTENT
		2138:39 APR	American niner six five, distance now?
		2138:42 RDO-1	uuuh, what did you want sir?
		2138:45 APR	distance DME.
		2138:46 RDO-1	OK the distance from uh, Cali is uh, thirty eight.
2138:49 HOT-2	uh where are we		
		2138:49 APR	roger.
2138:52 HOT-2	we goin' out to		
2138:54 HOT-1	let's go right to uh, Tulua first of all, OK?		
2138:58 HOT-2	yeah, where we headed?		
2138:58 HOT-1	seventeen seven, ULQ uuuh, I don't know what's this ULQ? what the, what happened here?	?	
2139:04 HOT-2	manual		
2139:05 HOT-1	let's come to the right a little bit.		

TIME & Source	CONTENT	TIME & Source	CONTENT
2139:06 HOT-2	yeah he's wantin' to know where we're headed.		
2139:07 HOT-1	ULQ. I'm goin' to give you direct Tulua		
2139:10 HOT-2	OK.		
2139:10 HOT-1	right now.		
2139:11 HOT-1	OK, you got it?		
2139:13 HOT-2	OK.		
2139:14 HOT-1	and		
2139:18 HOT-1	it's on your map. should be.		
2139:19 HOT-2	yeah, it's a left uh, left turn.		
2139:22 HOT-1	yeah, I gotta identify that # though I		
		2139:25 NAV-1	[sound of Morse code VC, "dit dit dah, dah dit dah dit"]
2139:25 HOT-1	OK, I'm gettin' it. seventeen seven. just doesn't look rigl mine. I don't know why.	nt on	

TIME & Source	CONTENT	TIME & Source	CONTENT
		2139:29 NAV-1	[sound of Morse code, similar to ULQ, "dit dit dah dit dah dit dit dah dah dit dah dit"]
2139:30 HOT-2	left turn, so you want a left turn back around to ULQ.		
2139:32 HOT-1	nawww hell no, let's press on to		
2139:35 HOT-2	well we're, press on to where though?		
2139:37 HOT-1	Tulua.		
2139:39 HOT-2	that's a right u u.		
2139:40 HOT-1	where we goin'? one two come to the right. let's go to Cali first of all, lets, we got # up here didn't we.	i.	
2139:45 HOT-2	yeah.		
2139:46 HOT-1	go direct CLO how did we get # up here?		
2139:54 HOT-1	come to the right, right now, come to the right, right now.		
2139:56 HOT-2	yeah, we're, we're in a heading select to the right.		
		2139:59 RDO-1	[sound of click]

TIME & Source	CONTENT	TIME & Source	CONTENT
		2140:01 RDO-1	and American uh, thirty eight miles north of Cali, and you want us to go Tulua and then do the Rozo uh, to uh, the runway, right? to runway one nine?
		2140:11 APR	***, you can * landed, runway one niner, you can use, runway one niner. what is (you) altitude and (the) DME from Cali?
		2140:21 RDO-1	OK, we're thirty seven DME at ten thousand feet.
2140:24 HOT-1	you're OK. you're in good shape now.		
		2140:25 APR	roger.
2140:26 HOT-1	we're headin'		
		2140:27 APR	report (uh) five thousand and uh, final to one one, runway one niner.
2140:28 HOT-1	we're headin' the right direction, you wanna		
2140:32 HOT-1	# you wanna take the one nine yet?		
2140:34 HOT-1	come to the right, come come right to CaCali for now, OK?		
2140:35 HOT-2	OK.		

TIME & Source	CONTENT	TIME & Source	CONTENT	
2140:40 HOT-1	it's that # Tulua I'm not getting for some reason.			
2140:44 HOT-1	see I can't get, OK now, no, Tulua's # up.			
2140:48 HOT-2	OK. yeah.			
2140:49 HOT-1	but I can put it in the box if you want it.			
2140:52 HOT-2	I don't want Tulua. let's just go to the extended cer uh	nterline of		
2140:55 HOT-1	which is Rozo.			
2140:56 HOT-2	Rozo.			
2140:56 HOT-1	why don't you just go direct to Rozo then, alright?			
2140:58 HOT-2	OK, let's			
2140:59 HOT-1	I'm goin' to put that over you.			
2141:00 HOT-2	get some altimeters, we're out of uh, ten now.			
2141:01 HOT-1	alright.			

TIME & Source	CONTENT	TIME & Source	CONTENT
		2141:02 APR	niner six five, altitude?
		2141:05 RDO-1	nine six five, nine thousand feet.
		2141:10 APR	roger, distance now?
2141:15 CAM-4	terrain, terrain, whoop, whoop		
2141:17 HOT-1	oh #		
2141:17 CAM	[sound similar to auto pilot disconnect warning starts]		
2141:18 HOT-1	pull up baby.		
2141:19 CAM-4	pull up, whoop, whoop, pull up.		
2141:20 CAM	[sound similar to aircraft stick shaker]		
2141:20 HOT-2	it's OK.		
2141:21 CAM-4	pull up.		
2141:21 HOT-1	OK, easy does it, easy does it.		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT		
2141:22 CAM	[sound similar to auto pilot disconnect warning and sound similar to aircraft stick shaker stops]				
2141:23 HOT-2	(nope)				
2141:24 HOT-1	up baby				
2141:25 CAM	[sound similar to aircraft stick shaker starts and continues to pact]	im-			
2141:25 HOT-1	more more.				
2141:26 HOT-2	OK.				
2141:26 HOT-1	up, up, up.				
2141:27 CAM-4	whoop, whoop, pull up.				
2141:28 END of RECORDING					
END of TRANSCRIPT					