Docket No. **SA-517**

Exhibit No. **12A**

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

Cockpit Voice Recorder Transcript
Korean Air Flight 801
DCA97MA058

Guam
August 6, 1997

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

SPECIALIST'S FACTUAL REPORT OF INVESTIGATION

DCA97MA058

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

March 1, 1998

Cockpit Voice Recorder - 12

Group Chairman's Factual Report
by Albert G. Reitan

A. ACCIDENT

Location:	A. B. Won Pat, Guam International Airport, Agana, Guam
Date:	August 8, 1997
Time:	0142 Guam local time
Aircraft:	Korean Air flight 801, B-747-300, HL-7468
NTSB Number:	DCA97MA058

B. GROUP

Chairman:	Albert G. Reitan Transportation Safety Specialist - CVR National Transportation Safety Board
Member:	Vincent Giuliana Electronic Engineer National Transportation Safety Board
Member:	Alice Y. Park Electronic Engineer - FAA Radar Specialist National Transportation Safety Board
Member:	Harold Dormer Air Safety Investigator Federal Aviation Administration
Member:	Yong S. Kim Project Manager Federal Aviation Administration
Member:	Sang Hee Han 747/767 Service & Post-Production Engineering Boeing Commercial Airplane Group

B. GROUP (cont.)

Member: Jim D. Jones
Pilot
Boeing Commercial Airplane Group

Member: Ricky L Hollis
Pratt & Whitney

Member: Heung OK Choi
Accident Investigation & Prevention
Ministry of Construction & Transportation
Republic of Korea

Member: Woo Jong Lee
Aeronautical Engineering Division
Civil Aviation Bureau
Ministry of Construction & Transportation
Republic of Korea

Member: Dal Yong Yoon
Aeronautical Engineering Division
Civil Aviation Bureau
Ministry of Construction & Transportation
Republic of Korea

Member: Capt. Y. W. Chung
B-747 Chief Pilot/Check Pilot
Flight Crew Operations Team
Korean Air

Member: Yung Yook Kim
Manager F/E, Flight Safety Team
Korean Air

Member: Se Chan Kim
Director General
MOCAT

C. SUMMARY

A Fairchild model A-1 00A cockpit voice recorder (CVR), s/n 61216, was brought to the audio laboratory of the National Transportation Safety Board on August 8, 1997. The Cockpit Voice Recorder committee convened on August 10, 1997. The group re-conveniened on October 27, 1997 to provide an English and Korean language transcript. The transcript includes the entire 31:01 minute recording. (attached)

D. DETAILS OF INVESTIGATION

The exterior of the CVR showed no evidence of structural damage. 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. Three other channels contained the Captain, First Officer and Second Officer audio panel information. The fourth also contained interphone and public address information. Timing on the tape was established using the time of the accident supplied by the investigator-in-charge.

The transcript starts as the crew is preparing for descent from the cruise altitude of forty one thousand feet into the Guam International airport. The transcript continues as the crew briefs for the approach and discusses the usability of the airport ILS system. The recording ends shortly after the aircraft impacts terrain and power is removed from the CVR.

Albert G. Reitan
Transportation Safety Specialist (CVR)

Attachments:

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.

U 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.

Transcript of a Fairchild A-1 OOA cockpit voice recorder (CVR), s/n 61216, installed on a Boeing B-747-300, HL-7468, which was involved in a collision with terrain while approaching the A. B. Won Pat, Guam International Airport, Agana, Guam, on August 8, 1997.

LEGEND

CAM	**Cockpit area microphone voice or sound source**
RDO	**Radio transmission from accident aircraft**
NAV	**Navigation signal identifiers heard through aircraft audio system**
PA	**PA voice transmitted over aircraft public address system**
CTR	**Radio transmission from Guam center controller**
TWR	**Radio transmission from Guam tower controller**
GPWS	Voice identified as aircraft mechanical voice
-1	**Voice identified as Pilot-in-Command (PIC)**
-2	**Voice identified as Co-Pilot (SIC)**
-3	**Voice identified as Flight Engineer**
.?	**Voice unidentified**
•	**Unintelligible word**
@	**Nonpertinent word**
#	**Expletive**
---	**Break in continuity**
( )	**Questionable insertion**
[1	**Editorial insertion**
.....	**Pause**

Note 1: **Times are expressed in universal coordinated time** (UTC).

Note 2: **Entries** that are stated either partially or completely in the Korean language are shown as two entries. The first, in bold type, is translated to English . The second is typed as it was spoken in the Korean/English languages. Items with only one entry were spoken entirely in English.

Note 3: Only radio transmissions to and from the accident aircraft were transcribed.

National Transportation
Safety Board

Memorandum

PLACE : Washington D.C.

DATE : October 30, 1997

NTSB # : **DCA97MA058,** Korean Air, Guam

IIC : Greg Feith

We the undersigned Cockpit Voice Recorder group members have reviewed the accident recording and updated the the original english language CVR transcript. In addition we have prepared a transcript in the Korean language. We agree that these transcripts are the best effort of the combined group and concur with their contents.

Alice Y. Park, NTSB translator _____

Yong S. Kim, FAA _____ 10/30/97

Sang Hee Han, Boeing _____ 10/30/97

Lee Woo Jong, Civil Aviation Bureau _____ 30/10.

Yoon Dal Yong, Civil Aviation Bureau _____

Choi Heung OK, Civil Aviation Bureau _____

Capt Y. W. Chung Korean Air _____

Yung Yook Kim Korean Air _____ 10/30

Albert G. Reitan, NTSB
CVR Group Chairman

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
START of RECORDING			
START of TRANSCRIPT 1511:42			
		1511:42 NAV	[sound of AJA NDB and the NIMITZ VOR signals continue through end of recording]
1511:46 CAM-?	[several unintelligible words]		
1511:51 **CAM-1**	**I will give you a short briefing .. ILS is one one zero three .. NIMITZ VOR is one one five three, the course zero six three, since the visibility is six, when we are in the visual approach, as I said before, set the VOR on number two and maintain the VOR. for the TOD, I will add three miles from the VOR, and start descent when we're about one hundred fifty five miles out. I will add some more speed above the target speed. well, everything else is all right. in case of go-around, since it is VFR, while staying visual and turning to the right at . . . , request a radar vector. if not, we have to go to FLAKE ... turn towards FLAKE ... turning towards a course zero six two outbound heading two four two and hold as published. since the localizer glide slope is out, MDA is five hundred sixty feet and HAT is three hundred four feet. it was a little lengthy. this concludes my landing briefing.** 아, 간단히 말씀드리겠습니다. ILS가 110.3,		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
	NIMITZ VOR 115.3, course 063, 시정 6 이라니까 visual 되면, 음. . 아까 이야기 했던대로.. . . 어- - , VOR NO 2 는 VOR 계속 set해 주시고 . . . VOR plus 3 되는대로, TOD (잡고?) 내려가겠습니다. 3 more 하므로 한 . . 백오십오 마일 정도부터 내려갈께요. 음. . 항공기가 속도 줄으면 확 떨어지니까, 스피드좀 내겠습니다. 음. . 다른 것은 큰 지장없지요? 만일에 go around 하게되면은 VFR이니까 그냥 visual로 두는 상태여야지 . . . . 에서 right turn 해서 들어가면서. . ., 어. . . radar vector 요구하든지, 어 . . 그렇게하고 . . . 바로 그렇지 않으면 지금 FLAKE로 들어가야 하니까, FLAKE 쪽으로 들어가 가지고 turn course 062. 음. .outbound heading 242 로 holding 하면 되겠습니다. locallizer glide slope이 out 되어 있기 때문에 MDA는 560 feet이고, HAT는 304 feet, 아휴. . . 브리핑 양이 너무 많았습니다. 이상입니다.		
1513:06 **CAM**	**[sound of cough or sneeze]** 음. . .		
1513:33 **CAM-1**	**we better start descent.** 자, 이제 내려가지요.131313		
1513:35 **CAM-2**	**yes.** 네.		
1513:38 CAM	[sound of several clicks]		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1513:40 RDO-2	and Guam center .. Korean eight zero one leaving level four one zero for two thousand six hundred.
		1513:44 CTR	Korean air eight zero one roger.
1513:58 CAM	[sound similar to that of seat movement]		
1514:30 CAM	[sound of several clicks]		
1514:32 CAM	[sound similar to that of seat movement]		
1514:35 **CAM-3**	**here it is, landing data card.** 자, 여기 있습니다, 랜딩 데이타 카드.		
1514:37 CAM-1	O.K. thank you.		
1514:41 CAM	[sound of several clicks]		
1514:55 CAM-1	altimeter two niner eight six, one hundred thirty four knots [several unintelligible words]		
1515:17 CAM	[sound of several loud clicks]		
1515:54 CAM	[sound similar to that of seat movement]		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1516:57 **CAM-1**	**there is bunch of something.** 뭐가 많이있다.		
1518:26 **CAM-?**	**there . . . [several unintelligible words]** 저기. . . (불분명)		
1519:22 CAM	[break in CVR audio, similar to that of tape splice]		
1520:01 **CAM-1**	**if this round trip is more than a nine hour trip, we might get a little something. with eight hours, we get nothing. eight hours do not help us at all.** 이거 뭐. . 왕복해가지고, 한 . .아홉시간 나와야 . . 뭐 조금이라도 있는 것 아니야. 이것 여덟시간 나오면 말짱 헛 일 아니야. 여덟시간 가지곤 아무 도움도 안되는것.		
1520:20 **CAM-1**	**they make us work to maximum, up to maximum . . .** 아이구. maximum으로 고생시키는 구나, maximum으로. . .		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1520:28 CAM-1	**probably, this way (unintelligible words), hotel expenses will be saved for cabin crews, and maximize the flight hours. anyway, they make us (B747) classic guys work to maximum.** 이게 아마, 왜이래 되면 (알아 들을 수 없는 말 . .), cabin승무원들 호텔비 않들어 가지요. 비행시간 maximum으로 태우죠. 그래서, normal jumbo 만 잡아먹는 거야.		
1520:35 CAM	[sound similar to that of seat movement]		
1521:13 CAM-1	**eh.... really ... sleepy . . .(unintelligible words)** 어. . . 정말로. . 졸려서. . . (불분명)		
1521:15 CAM-2	**of course.** 그럼요.		
1521:59 CAM-2	**captain, Guam condition is no good.** 괌이 안좋네요. 기장님.		
		1522:06 CTR	Korean air eight zero one information uniform is current at Agana now .. altimeter two niner eight six.
		1522:11 RDO-2	Korean .. eight zero one is checked uniform.

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1522:16 CAM-2	two nine eighty-six.		
1522:26 **CAM-1**	**uh, it rains a lot.** 야! 비가 많이온다.		
1523:35 **CAM-1**	**(unintelligible words)** (불분명)		
1523:45 **CAM-1**	**request twenty miles deviation later on.** 가다가 이쯤에서 한 20 마일 요청해.		
1523:47 **CAM-2**	**yes.** 네.		
1523:46 **CAM-1**	**. . . to the left as we are descending.** . . . 내려가면서 좌측으로.		
1523:48 **CAM**	[sound similar to that of seat movement]		
1524:00 **CAM-?**	**chuckling. . . .[several unintelligible words]** 으하하하.(unintelligible word)		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1524:02 **CAM-2**	don't you think it rains more? in this area, here? 더 오는 것 갔죠? 이 안에.		
1524:07 **CAM-1**	**left, request deviation.** left 로, request deviation.		
1524:08 CAM-2	yes. 예.		
1524:09 **CAM 1**	one zero mile.		
1524:10 **CAM 2**	**yes.** 예.		
1524:14 CAM	[sound of three chimes, similar to that of passenger seat belt signal]		
		1524:30 RDO-2	Guam center .. Korean eight zero one request deviation one zero mile left of track.
		1524:35 CTR	zero one approved.
		1524:36 RDO-2	thank you.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1525:03 CAM-3	descent checklist.		
1525:05 CAM-2	(yes please).		
1525:07 CAM-3	cabin pressurization set .. landing data speed bug one two niner?		
1525:13 CAM-?	set.		
1525:15 CAM-?	one two niner.		
1525:17 CAM-?	fuel set for landing [several unintelligible words] . . . normal		
1525:22 CAM-3	seat belt?		
1525:23 CAM-1	on.		
1525:25 CAM-3	altimeters stand by.		
1525:28 **CAM-?**	**where is it? . . .[several unintelligible words] weather radar. . .** 어디 있어요?. . . weather radar. . . .		
1525:35 CAM-3	two niner eight six.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1525:38 CAM-?	landing briefing completed. . .		
1525:41 CAM-?	altimeter two niner eight six.		
1526:09 **CAM-3**	**[several unintelligible words] we are supposed to be going out right hand side from here . . . .** (불분명). . . . 여기서 이제 오른쪽으로 나가야 되지 않는가뵈. . .		
1526:12 **CAM-?**	**yes, request please.** 예, 요청하세요.		
1526:18 **CAM-1**	**going right hand side, then getting out of the left hand side. next is left hand side . . .** 오른쪽 갔다, 왼쪽 나가야 되네. 다음은 왼쪽. . .		
1526:21 **CAM-3**	**how about GUAM condition?** 괌 상황은 어떤데?		
1526:23 **CAM 3**	**is it GUAM?** 괌 이야?		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1526:25 **CAM-3**	**[several unintelligible words] it's Guam, Guam.** 이거 괌 이야, 괌.		
1526:27 **CAM-1**	**[chuckling] good.** 허 허 허. 괌 좋네.		
1526:31 CAM	[sound similar to that of seat movement]		
1527:17 **CAM-3**	**[several unintelligible words] . . . because . . .** . . . 하니까. (기상 레이다를 보고 있는 것으로 추정 됨.)		
1527:58 **CAM-3**	**today weather radar has helped us a lot.** 오늘 weather radar 덕 많이 본다.		
1527:59 **CAM-1**	**yes, they are very useful.** 예, 좋긴 좋아요.		
1528:52 CAM-?	[several unintelligible words]		
1528:54 **CAM-1:**	request heading one sixty.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
		1528:56 RDO-2	Guam center, Korean eight zero one request right turn heading one six zero.
		1529:08 CTR	say again?
		1529:09 **RDO-2**	Korean eight zero six ah eight zero one maintain heading one six zero.
		1529:15 CTR	eight zero one approved.
		1529:16 RDO-2	roger.
1529:36 CAM-1	course zero six three.		
1529:38 CAM-2	set.		
1529:50 **CAM-1**	**if we take this way,** 이렇게 이리로 들어가면은,		
1529:52 **CAM-3**	**yes.** 예.		
1529:56 **CAM1**	**we should be getting . . . . onto the route.** 우리가 대강 그대로 . . . (확실치 않음) 들어갈 것 같은대.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1531:08 **CAM-3**	**it is rising instead.** 오히려 더 불어.		
1531:10 **CAM 1**	**yeh, you are right.** 예, 맞습니다.		
		1531:17 **RDO-2**	Guam center Korean eight zero one clear of Charlie Bravo request radar vector for runway six left.
		1531:31 **CTR**	Korean eight zero one fly heading one two zero.
		1531:34 **RDO-2**	heading one two zero Korean one .. eight zero one.
1531:39 CAM-3	approach checklist?		
1531:41 CAM-1	approach checklist.		
1531:42 CAM-3	inboard landing lights?		
1531:43 CAM-1	on.		
1531:44 CAM-3	radio and nav instruments?		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1531:45 CAM-1	set and cross check.		
1531:46 CAM-2	set and cross check.		
1531:47 CAM-3	radio altimeters?		
1531:48 CAM-1	set.		
1531:49 CAM-2	set.		
1531:50 CAM-3	three hundred . . .		
1531:51 CAM-1	three oh four.		
1531:52 CAM-?	three zero four.		
1531:55 CAM-3	shoulder harness?		
1531:55 CAM-1	on.		
1531:56 CAM-3	approach checklist complete.		
1532:11 CAM	[sound similar to that of seat movement]		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1532:17 CAM	[sound similar to that of seat movement]		
1532:24 CAM	[sound of several clicks]		
1533:03 **CAM-1**	**set number one ILS frequency.** number one ILS frequency 하세요..		
1533:05 CAM-?	number one.		
1533:05 **CAM?**	**correct?** 맞아요?		
1533:06 **CAM?**	**yes.** 네.		
1533:06 CAM-?	one one zero three.		
1533:07 CAM-?	one one zero three.		
1533:09 **CAM-2**	**set.** set 했습니다.		
1533:11 CAM-1	roger.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1533:18 CAM	[sounds of several loud clicks]		
1533:32 CAM	[sound similar to that of seat movement]		
1533:38 **CAM-1**	**what's the number for Guam .. seventeen?** 괌 이 몇번 이지요, . . . 십칠번?		
1533:4 **CAM-2**	**seventeen.** 십칠 번.		
1533:47 CAM-?	[several unintelligible words]		
1534:05 **CAM-1**	**ya, there is a big CB over there to the left.** 어, 저기 저 왼쪽에 있는거 CB 큰데?		
1534:07 CAM?	[unintelligible words] [불분명]		
1534:23 **CAM-3**	**is it going to be rough?** 이거는 그렇게 심해지지 않겠습니까?		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1534:24 **CAM-1**	**it may be better at lower altitude.** 저고도에 내려가면 조금 약해지겠지요.		
1534:33 CAM	[sound of click]		
1534:33 CAM-2	flaps one.		
1535:17 CAM	[sound of rattle, similar to that of stabilizer trim]		
1535:29 CAM-1	flaps one.		
1535:30 CAM-2	flaps one.		
1535:32 CAM	[sound of clicks]		
1535:34 CAM-2	one nine nine.		
1535:50 CAM-1	five.		
1535:51 CAM-2	flaps five ... one seventy nine.		
1535:53 CAM	[sound of click]		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1536:13 CAM	[sound of rattle, similar to that of stabilizer trim]		
1536:33 CAM-?	[several unintelligible words]		
1537:07 **CAM-1**	**INS DME display . . . [several unintelligible words]** INS DME 가 나오. . . .?		
1537:09 **CAM-?**	**yeh.** 예.		
1537:55 CAM	[sound of altitude alert]		
1538:12 CAM	[sound of click]		
1538:13 CAM	[sound of slight increase in wind/background noise]		
1538:34 CAM	[sound of loud clunk]		
1538:37 CAM-1	flaps ten.		
1538:37 CAM-2	yes sir, flaps ten.		
1538:39 CAM	[sound of click]		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1538:40 CAM-2	one fifty-nine.		
		1538:49 CTR	Korean air eight zero one turn left heading zero niner zero join localizer.
1538:52 CAM	[sound of click]		
		1538:53 RDO-2	* heading zero nine zero intercept the localizer.
1538:57 CAM-1	turn to the *.		
1539:09 CAM	[sound of rattle, similar to that of stabilizer trim]		
1539:12 CAM	[sound of slight decrease in wind/background noise]		
1539:18 CAM	[sound of slight increase in wind/background noise]		
1539:20 **CAM-?**	**oooh (suprised expression).** 우-- (놀란 표현)		
1539:23 CAM	[sound of slight decrease in wind/background noise]		

	INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1539:25 **CAM-?**	**cool and refreshing.** 시원 하겠다.		
1539:28 CAM-?	[several unintelligible words]		
1539:30 **CAM-2**	**glide slope . . . [several unintelligible words] . . . localizer capture [several unintelligible words] glide slope . . . did.** glide slope . . . [불분명] . . . . localizer capture . . . [불분명] glide slope . . . 했읍니다.		
		1539:44 CTR	Korean air eight zero one .. cleared for ILS runway six left approach .. glide slope unusable.
		1539:48 RDO-2	Korean eight zero one roger .. cleared ILS runway six left.
1539:55 **CAM-3**	**is the glide slope working? glide slope? yeh?** glide slope 되요? glide slope? 예?		
1539:56 **CAM-1**	**yes, yes, it's working.** 예, 예 됩니다.		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1539:57 **CAM-3,**	**ah, so . . .** 아 이, 그래서..		
1539:58 **CAM-?**	**check the glide slope if working?** glide slope 되나 보라구?		
1539:59 **CAM-?**	**why is it working?** glide slope 왜 나오죠?		
1540:00 CAM-2	not usable.		
1540:01 **CAM-3**	**six D check, gear down.** six D서 check, gear 내려야죠.		
1540:04 CAM-1	check...		
1540:06 CAM	[sound of altitude alert]		
1540:07 CAM	[sound of click]		
1540:16 CAM-?	[several unintelligible words]		
1540:20 CAM	[sound of clicks]		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1540:21 CAM	[sound of increase in wind/background noise]		
1540:22 **CAM-?**	**glide slope is incorrect.** glide slope 틀린다.		
1540:33 **CAM-2**	**approaching fourteen hundred.** 천사백 들어 가죠.		
1540:37 **CAM-1**	**since today's glide slope condition is not good, we need to maintain one thousand four hundred forty. please set it.** glide slope 오늘 상태가 않좋으니까, 천사백사십 을 지켜야 돼니까, 셋트 하시고,		
1540:40 CAM?	{29:09} yes. 예.		
		1540:42 CTR	Korean air eight zero one contact the Agana tower one one eight point one "ahn nyung hee ga sae yo"[goodby in Korean language]
		1540:47 RDO-2	"soo go ha sip si yo"[take care in Korean language] .. one eighteen one.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1540:50 **CAM-3**	**the guy working here probably was a GI in korea before.** 한국에서 근무하던 양놈들이, 아마 여기 미군들이 근무 할거야.		
1540:52 **CAM-1**	**yes.** 예.		
		1540:55 RDO-2	Agana tower Korean air eight zero one intercept the localizer six left.
1540:56 CAM	[sound of configuration warning horn]		
1540:57 CAM	[sound of altitude alert]		
		1541:01 TWR	Korean air eight zero one heavy Agana tower runway six left wind .. at zero niner zero at seven .. cleared to land .. verify heavy boeing seven four seven tonight.
1541:11 CAM	[sound of three clicks, similar to flap handle movement]		
		1541:14 RDO-2	Korean eight zero one roger .. cleared to land six left.
		1541:18 TWR	Korean eight zero one heavy roger.

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1541:20 CAM	[sound similar to that of seat movement]		
1541:22 CAM-1	flaps thirty.		
1541:23 CAM-2	flaps thirty.		
1541:24 CAM	[sound of click, similar to that of flap handle movement]		
1541:24 CAM	[sound of configuration warning horn]		
1541:27 **CAM-2**	**flaps thirty, confirmed.** flaps thirty 됐고.		
1541:31 CAM-2	landing check.		
1541:32 **CAM-1**	**[several unintelligible words] . . . look carefully.** (불분명) ...하나 잘봐요.		
1541:33 **CAM-1**	**set five hundred sixty feet. [noise increased].** 오백육십 피트 셋트. (소음 증가)		
1541:35 CAM	[sound of rattle, similar to that of stabilizer trim]		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1541:35 CAM-2	set.		
1541:37 CAM-1	landing check.		
1541:40 CAM-3	tilt check normal.		
1541:41 CAM-1	yes.		
1541:42 GPWS	one thousand.		
1541:43 CAM-1	no flags gear and flaps.		
1541:44 CAM	[sound similar to that of seat movement]		
1541:45 CAM-3	no flags gear and flaps.		
1541:45 CAM	[sound of altitude alert]		
1541:46 **CAM-1**	**isn't glide slope working?** glide slope 안돼나?		
1541:48 CAM-1	wiper on.		
1541:49 CAM-3	yes, .. wiper on.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1541:53 CAM-2	landing checklist.		
1541:53 CAM	[sound similar to windshield wiper starts and continues to end of recording]		
1541:55 CAM-3	ignition flight start flight start.		
1541:59 **CAM-2**	**not in sight?** **않보이 잖아?**		
1542:00 GPWS	five hundred.		
1542:02 CAM-3	eh? [astonished tone]		
1542:03 CAM-?	stabilize, stabilize.		
1542:04 CAM-1	oh, Yes.		
1542:05 CAM-3	auto-brake?		
1542:07 CAM-1	minimum.		
1542:07 CAM-3	minimum.		
1542:08 CAM-1	landing gear down in green.		

INTRA-COCKPIT COMMUNICATION		AIR-GROUND COMMUNICATION	
TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1542:09 CAM-3	landing gear down in green.		
1542:09 CAM-3	speed brakes armed.		
1542:10 CAM-?	armed.		
1542:11 CAM-3	no smoke sign on?		
1542:12 CAM-1	on course.		
1542:12.81 CAM-3	flaps?		
1542:13.64 CAM-?	thirty thirty green.		
1542:14.13 GPWS	minimums minimums.		
1542:14.70 CAM-3	hydraulics.		
1542:15.45 CAM-?	uh, landing lights.		
1542:17.15 GPWS	sink rate.		
1542:18.17 CAM-2	sink rate, okay.		
1542:19.04 CAM-3 1542:19.47	two hundred.		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
CAM-2	**let's make a missed approach.**		
	missed approach 합시다.		
1542:20.56 **CAM-3**	**not in sight.**		
	않보이 잖아.		
1542:21.07 **CAM-2**	**not in sight. missed approach.**		
	않보이죠. missed approach.		
1542:22.18 CAM-3	go around.		
1542:23.07 CAM-1	go around.		
1542:23.77 CAM	[sound of auto-pilot disconnect warning starts]		
1542:23.84 CAM-2	flaps.		
1542:24.05 GPWS	one hundred.		
1542:24.84 GPWS	fifty.		
1542:25.19 GPWS	forty.		
1542:25.50 GPWS	thirty.		

TIME & SOURCE	CONTENT	TIME & SOURCE	CONTENT
1542:25.78 GPWS	twenty.		
1542:25.78 CAM	[sound of initial impact]		
1542:28.65 CAM	[sound of tone]		
1542:28.91 CAM-?	[sound of groans]		
1542:30.54 CAM	[sound of tone]		
1542:31.78 CAM	[sound of tone]		
1542:32.53 **END of RECORDING**			

END of TRANSCRIPT