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

GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

CEN11FA193

By
Bill Tuccio

NATIONAL TRANSPORTATION SAFETY BOARD
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June 20, 2012

Cockpit Voice Recorder - 12

Group Chairman's Factual Report
By Bill Tuccio

A.   EVENT

Location:	Appleton, Wisconsin
Date:	February 14, 2011, 1315 Central Standard Time (CST) [*]
Aircraft:	Gulfstream GV-SP, N535GA
Operator:	Gulfstream Aerospace, Flight Gulftest 16
NTSB Number:	CEN11FA193

B.   GROUP

A group was convened on March 8, 2011.

Chairman:	Bill Tuccio
	Aerospace Engineer
	National Transportation Safety Board
Member:	Randy Gaston
	Vice President Flight Operations
	Gulfstream Aerospace Corporation
Member:	Eric E. West
	Air Safety Investigator
	Federal Aviation Administration

C.   SUMMARY

On February 14, 2011, about 1315 central standard time (CST), a Gulfstream Aerospace Corporation GV-SP airplane, N535GA, owned and operated by Gulfstream Aerospace Corporation, incurred substantial left wing damage during a landing overrun on runway 30 (6,501 feet by 150 feet, dry concrete) at the Outagamie County Regional Airport (ATW), near Appleton, Wisconsin. The flight crew reported a loss of a hydraulic

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[*] All times are expressed in CST, unless otherwise noted.

system. The two certified airline transport pilots and one passenger were not injured. The maintenance test flight was conducted under the provision of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and an instrument flight rules flight plan was on file for the flight. The local flight departed from ATW. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout. The CVR group meeting convened on March 8, 2011 and a partial transcript was prepared for the last 50 minutes, 15 seconds of the 2 hour, 2 minute, and 45 second digital recording (see attached).

D.   <u>DETAILS OF INVESTIGATION</u>

On February 17, 2011, the NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **Universal 1606**
Recorder Serial Number: **191**

Recorder Description
Per federal regulation, aircraft manufactured after April 7, 2010, must be equipped with a CVR that records a minimum of the last 2 hours of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 2 hours of CVR operation. This model CVR, the Universal 1606, is a solid-state CVR that records digital cockpit audio. Specifically, it contains a 4-channel recording of the last two hours of operation. The recording contains 4 channels of audio data; one channel for each flight crew, one channel for the cockpit area microphone (CAM) audio information, and a fourth channel for the third crewmember.

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

Audio Recording Description
The 2 hour, 2 minute and 45second recording consisted of four channels of useable audio information. Each channel's audio quality[†] is indicated in the Table 1.

Table 1: Channel Audio Quality

Channel Number	Content/Source	Quality
1	Pilot	Good
2	Copilot	Good

[†] See attached CVR Quality Rating Scale.

| 3 | CAM | Good |
| 4 | Third Crewmember | Excellent |

The quality of channels 1 through 3 were compromised by the gain settings of the audio channels. The gain settings were such that audio channels 1 through 3 were overdriven. The result of the overdriving was that high range frequency response was truncated, creating a blurred or blanketed response.

Timing and Correlation

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, five radio transmissions that the aircraft made were aligned to the radio transmit microphone key parameter from the FDR. Each of the five radio transmissions acted as an anchor point for the alignment between the remaining CVR events. The alignment resulted in an FDR subframe reference number (SRN) of 262,222.041 corresponding to CVR elapsed time of 0114:11.0. Further, the noted FDR SRN corresponded to an FDR Greenwich mean time (GMT) of 1842:33.5. Six hours was subtracted from GMT to arrive at 1242:33.5 central standard time (CST) as the local time corresponding to the noted CVR elapsed time of 0114:11.0. Accordingly, an offset of 1128:22.5 was added to all CVR elapsed times to convert to CST.

Description of Audio Events

The recording began at 1128:22.5 as the crew was conducting post certification flight tests at approximately flight level 250. The flight tests included loss of pressurization and cabin mask deployment tests and other assorted tests. The flight crew requested, from air traffic control (ATC), and received clearance to flight level 450, then 480, and finally flight level 510 for additional tests. The crew discussed the discomfort associated with oxygen mask usage, although there are no sounds associated with oxygen mask usage after the oxygen masks had been tested at lower flight levels. During the climb, the crew listened to the ATIS for the Appleton airport and further decided on a route of flight consisting of an ILS approach at Green Bay followed by a return to Appleton.

At 1213:55, at flight level 510, the captain left the cockpit to go to the bathroom for approximately three minutes. During the captain's absence from the flight deck there was no sound recorded consistent with oxygen mask usage.

At 1218, the crew requested and received a descent to flight level 390, with further descents to flight level 240. During the descent, further flight tests were conducted. The ATIS at Green Bay was recorded as wind 9 knots from 330 degrees, clear below 12,000 feet, temperature 1 degree Celsius, with visual approaches to runway 24 and 36 in use. In the course of conducting flight tests, the crew setup and briefed the ILS 36 approach at Green Bay and associated flight tests to be conducted during the approach.

During the descent, at 1231:24, the crew experienced an auto trim failure. The crew noted the trim system had experienced some abnormalities on the ground, and further discussed the impact of the auto trim failure on the autopilot system.

The flight continued its descent and the crew noted level off at 10,000 feet, at approximately 1238:46. During the descent, the crew set altimeters to ATC assigned 30.10 and turned on the strobe lights. At 10,000 feet the crew conducted a trim test, slowing the aircraft to 250 knots and then attempting an acceleration to 340 knots.

During the acceleration test, the auto trim failed, as the crew had expected based on prior auto trim failures.

The attached transcript began at 1240:53.1 and continued until 1331:07.6, coincident with the end of the recording.

As part of the Safety Board's accident investigation process, the flight crew was invited to review the CVR transcript and suggest corrections. On March 16, 2011, both the captain and co-pilot listened to the recording and reviewed the draft report. They had the following comments:

- At 1259:30.8, "auto * it worked...auto course transfer...two thousand feet HUD...airport symbol you got it?", the unintelligible word was "preview."
- At 1306:30.8, "I needa' check the ah auto...re...auto throttle retard and ah max thrust reverser," was said by HOT-1 not by HOT-2.
- At 1253:48.3, "there they are," was said by HOT-2 not by HOT-1.
- At 1309:49.5, "that's pretty good I'll let you dick with it tomorrow," was referring to the enhanced vision system (EVS) calibration.
- At 1311:36.4, "we got F (two) one and one we got the right thrust reverser," should read "we got an uphill runway we got the right thrust reverser."
- At 1313:07.1, "...* thirty seconds," is referring to the emergency checklist operation of the auxiliary pump for 30 seconds.

Bill Tuccio
Aerospace Engineer
Vehicle Recorder Division

CVR Quality Rating Scale

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

Excellent Quality Virtually all of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate only one or two words that were not intelligible. Any loss in the transcript is usually attributed to simultaneous cockpit/radio transmissions that obscure each other.

Good Quality Most of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions that obscure each other.

Fair Quality The majority of the crew conversations were intelligible. The transcript that was developed may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.

Poor Quality Extraordinary means had to be used to make some of the crew conversations intelligible. The transcript that was developed may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio) or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.

Unusable Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.

Transcript of a Universal 1606 solid-state cockpit voice recorder, serial number 191, installed on a Gulfstream GV-SP (N535GA), which overran the runway at the Outagamie County Regional Airport in Appleton, Wisconsin.

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LEGEND

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CAM	Cockpit area microphone voice or sound source
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from N535GA
CTR	Radio transmission from center controller
APR	Radio transmission from the approach controller
TWR	Radio transmission from the airport tower controller
EGPWS	Enhanced Ground Proximity Warning System
RAAS	Runway Awareness and Advisory System
ARFF	Airport Rescue and Fire Fighting
-1	Voice identified as the captain
-2	Voice identified as the co-pilot
-3	Voice identified as the test flight technician
-?	Voice unidentified
*	Unintelligible word
#	Expletive
@	Non-pertinent word
( )	Questionable insertion
[ ]	Editorial insertion

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.

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

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
11:28:22.5 **START OF RECORDING**			
12:40:53.1 **START OF TRANSCRIPT**			
		12:40:53.1 **RDO-2**	Gulftest one six is now ah headin' on down to eight thousand
		12:40:56.0 **APR**	Gulftest one six roger contact Green Bay approach one one niner point five goodday
		12:41:00.1 **RDO-2**	nineteen five goodday Gulftest one six
12:41:07.0 **HOT-1**	I don't have to preview or any of that # I just friggin' do it		
12:41:18.7 **HOT-2**	I felt that		
12:41:19.7 **HOT-1**	yeah		
12:41:26.8 **HOT-1**	hmmm how about them Packers		
12:41:28.6 **HOT-2**	E-V-S how's that doin' for ya		
12:41:30.6 **HOT-1**	oh yeah helps if I look at it		
12:41:39.8 **HOT-1**	this one needs some tweakin'		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:41:41.7 HOT-1	and then once when I get this thing I'll be able to change--		
12:41:44.1 HOT	[sound of low pitch tone, similar to altitude alert]		
12:41:44.1 HOT-1	* I'll do it after Green Bay		
12:41:46.6 HOT-2	I already put the approach in and it lost it		
12:41:50.3 HOT-1	*		
12:41:51.3 HOT-2	I-L-S three six		
12:41:52.6 HOT-3	good		
12:41:52.9 HOT-?	green		
12:41:53.2 HOT-2	okay thanks		
12:42:02.1 HOT-1	I'll worry about the E-V-S enroute to Appleton		
12:42:12.6 HOT-2	v-ref is going to be one twelve		
12:42:17.3 HOT-1	it's a little bit bumpy [singing]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:42:20.3 **HOT-1**	did you check in with Green Bay yet?		
		12:42:22.7 **RDO-2**	Green Bay Gulftest one six with you at eight thousand
		12:42:25.1 **APR**	Gulftest one six Green Bay approach expect I-L-S runway three six approach at Green Bay
12:42:26.0 **HOT-1**	jeeze		
		12:42:32.3 **RDO-2**	I-L-S three six approach ah we do have Delta and we will be requesting the climbout towards SUDIE for the r-nav G-P-S three zero to Appleton
12:42:43.8 **HOT-1**	I can't believe you didn't give him a how about them packers dude		
12:42:47.3 **HOT-1**	huh?		
12:42:48.0 **HOT-1**	how about them packers		
12:42:49.3 **HOT-2**	I don't like them man		
12:42:51.9 **HOT-2**	I don't care		
12:42:53.5 **HOT-1**	*** the ah all the buggies * snow ah what do you call it		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:43:00.7 **HOT-1**	snow machines...what are they called?		
12:43:02.0 **HOT-1**	snow ah ah		
12:43:02.9 **HOT-2**	snowmobiles		
12:43:03.9 **HOT-1**	snowmobile tracks in the ah in the lakes		
12:43:04.5 **HOT-2**	***		
12:43:08.6 **HOT-1**	yep		
12:43:10.0 **HOT-1**	cool		
12:43:11.3 **HOT-1**	[imitating sound of snowmobile]		
12:43:19.3 **HOT-1**	west northwest of Appleton airport [imitating controller]		
12:43:24.7 **HOT-1**	three six we gotta go all the way on the far side of the field		
12:43:27.6 **HOT-2**	goin' to nav two here		
12:43:29.5 **HOT-2**	that's what it calls for and its gonna' be zero zero two		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:43:32.4 HOT-1	let's see we're going to do a friggin' procedure turn back in here		
12:43:35.3 HOT-2	there gonna give us vectors		
12:43:38.7 HOT-1	* check this # out we're gonna do a damned procedure turn		
12:43:44.4 HOT-1	that's craazzy		
12:43:49.8 HOT-1	see if he can vector us on the west side of Appleton so if we can see the ski slope		
		12:43:53.6 APR	Gulftest one six I missed your last request say again
		12:43:57.4 RDO-2	following the I-L-S three six Green Bay we would like to head towards SUDIE for the r-nav G-P-S three zero to Appleton
		12:44:05.2 APR	Gulftest one six roger
12:44:06.9 HOT-1	how about them packers [imitating other voice]		
12:44:12.1 HOT-1	what's my baro speed altitude man * eight		
12:44:15.7 HOT-2	I've got eight ninety seven		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:44:17.7 HOT-1	eight ninety		
12:44:20.0 HOT-1	wow it's way up there		
12:44:21.4 HOT-2	um got some marker beacons goin' on so you can turn that on		
12:44:24.0 HOT-1	alright marker beacon [imitating another voice]		
12:44:25.9 HOT-2	got all your HUD setup? I think I already setup it for ya' six eighty or right there six ninety whatever you'd like		
12:44:32.7 HOT-1	yeah it's all setup dude		
12:44:36.0 HOT-1	I put my wizzy wheels on so I see all everything...even though I don't like wizzy wheels		
12:44:44.5 HOT-1	nobody knows the trouble I've seen...nobody knows but Jesus [singing]...that's right		
12:45:04.0 HOT-1	ah now it's gonna be a great day		
12:45:07.2 HOT-1	what time is it?		
12:45:08.4 HOT-2	uhm		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
		12:45:10.5 **APR**	Gulftest one six fly heading of one eight zero vector I-L-S runway three six descend pilots discretion maintain three thousand one hundred
		12:45:18.1 **RDO-2**	one eight zero we're leaving eight thousand for three thousand one hundred Gulftest one six
12:45:22.3 **HOT-2**	okay set three thousand one hundred		
12:45:24.3 **HOT-1**	come'n doooowwwwnnnn [singing]		
12:45:25.9 **HOT-2**	A-D-F set to DEPRE		
12:45:28.9 **HOT-1**	nice		
12:45:31.4 **HOT-2**	I do a good job		
12:45:32.6 **HOT-1**	yeah not bad		
12:45:37.4 **HOT-2**	okay goin' through six thousand this should ah catch up with us here		
		12:46:12.2 **APR**	Appleton airport information Mike now current
12:46:21.5 **HOT-1**	Mikey [imitating voice]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:46:22.8 **HOT-2**	I'm gonna go get Mike real quick		
12:46:24.4 **HOT-1**	alright		
		12:46:26.3 **ATIS**	one zero...expect the visual approach runway three runway three zero readback all runway hold short instructions and assigned altitudes notices to airman taxiway Papa closed advise on initial contact you have information Mike...Appleton tower information Mike one eight four five observation winds three four zero at one zero visibility one zero * few clouds three thousand five hundred temperature two dewpoint minus seven altimeter three zero one zero *
12:46:40.0 **HOT-1**	now did you come out of this now or not we'll see		
12:46:44.2 **HOT-1**	it kept our head in there		
12:46:48.8 **HOT-1**	oh I think that works		
12:46:53.4 **HOT-1**	don't you give me the finger		
12:47:02.0 **HOT-1**	I'm gonna strafe some # guys on the lake		
12:47:04.2 **HOT-2**	okay I got it nothing really changes just have Mike		
12:47:07.5 **HOT-1**	[imitates sound of machine gun, strafing]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:47:11.7 HOT-3	[unintelligible speaking]		
12:47:17.9 HOT-2	okay well ah we're headin' there now you can purge over the lake		
12:47:21.6 HOT-3	* fill it up		
12:47:23.1 HOT-1	yeah		
12:47:23.8 HOT-2	we're ah doin' an approach at Greenbay now then we'll do an approach back home		
12:47:28.4 HOT-1	you can purge whenever you want to		
12:47:30.3 HOT-3	[unintelligible speaking]		
12:47:31.1 HOT-2	yeah you can purge whenever you'd like to		
12:47:41.3 HOT	[sound of low pitch tone, similar to altitude alerter]		
12:47:42.7 HOT-1	think the lake is safe to walk on		
12:47:45.8 HOT-2	doesn't look like it		
12:47:46.9 HOT-1	yeah		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:47:49.5 HOT-2	I don't I don't * there's somein' out here in the middle what is that		
12:47:53.1 HOT-2	that's where they go fishin' got fish out there		
12:47:54.6 HOT-1	yeah		
12:47:55.3 HOT-2	goin' through thirty seven hundred feet pickin' up the bumps		
12:47:58.9 HOT-1	bumpy dude		
12:48:07.2 HOT-1	I'd say you got it		
12:48:13.1 HOT-2	plenty of gas we could do the V-O-R too if you want to		
12:48:14.3 HOT-1	yeah		
12:48:17.0 HOT-1	ahh that's okay		
12:48:20.9 HOT-2	* did he say expect vectors I-L-S?		
12:48:23.3 HOT-1	yeah I think so		
12:48:25.3 HOT-1	alright I'm gonna go down I'll make it now		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:48:29.8 **HOT-1**	you had good needles I don't * (preacher)		
12:48:38.0 **HOT-1**	ah you should tune to some'n else		
12:48:39.9 **HOT-2**	did you preview		
12:48:40.8 **HOT-1**	I haven't done anything		
12:48:42.2 **HOT-1**	I didn't touch it		
12:48:42.8 **HOT-2**	somethin' happened here		
12:48:45.7 **HOT-2**	yours is ah...I-S-G...no that's right...I-S-G-Z		
12:48:51.6 **HOT-1**	okay		
12:48:52.0 **HOT-2**	one oh nine point point and you should have zero zero two set...what are you complain'in about?		
		12:48:55.4 **APR**	Gulftest one six did you want a touch and go on three six or did you just want to fly the missed approach?
12:48:56.3 **HOT-1**	I don't know		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
		12:49:01.0 **RDO-2**	we're just gonna do a missed approach a ah climbout and we'll be ah delayed gear
		12:49:05.3 **APR**	Gulftest one six roger
12:49:07.4 **HOT-1**	look at the ah look at all the guys fishin over there man see they're walkin' on the ice over there see that little **...this is ah...this a little lighthouse...it is interesting how the the ice formed when the wind was blowing and made a little trail behind the		
12:49:27.1 **HOT-2**	yeah I see that		
12:49:28.0 **HOT-1**	yeah that's pretty cool		
12:49:31.4 **HOT-1**	how about them packers we're gonna fly right over Lombardi field [imitating a voice]		
12:49:56.3 **HOT-2**	I should have automatic F-M-S		
12:49:58.9 **HOT-1**	[yawn]		
12:50:00.0 **HOT-1**	when we get home wanna go for a boat ride		
12:50:03.8 **HOT-1**	throw your # in the # ice		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:50:08.1 HOT-1	slippery...you can see where it is melted by the factories over there...they use the water to cool somethin'		
12:50:16.8 HOT-2	yeah		
12:50:22.5 HOT-2	I saw a show on the big ships		
12:50:24.1 HOT-1	I'm activating vectors		
12:50:25.6 HOT-2	okay...on the big ships that navigate the Great Lakes during the winter		
12:50:29.9 HOT-1	yeah		
12:50:30.6 HOT-2	that was impressive		
12:50:32.1 HOT-1	yeah I'll bet		
12:50:33.5 HOT-2	* they were breakin' through the ice and one time they just got a hole in the ship		
12:50:37.3 HOT-2	even though it's an ice breaker...there's no ice over there on that lake		
12:50:41.6 HOT-1	that's the big boy		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:50:45.1 **HOT-1**	*		
12:50:45.1 **HOT-2**	they only have feet to spare...with with with the depths		
12:50:49.4 **HOT-1**	yeah		
12:50:52.1 **HOT-1**	that's Lake Michigan over there isn't it		
12:50:55.4 **HOT-1**	it don't freeze man...it gets cold though		
12:51:01.5 **HOT-1**	there it is Lombardi Field		
12:51:05.5 **HOT-1**	how about them packers how about them packers [imitating voice]		
12:51:06.2 **HOT-2**	*		
12:51:09.6 **HOT-2**	where is it?		
12:51:10.4 **HOT-1**	it's over there		
12:51:11.3 **HOT-1**	take the runway come over about...		
12:51:14.1 **HOT-2**	oh yeah		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:51:14.6 HOT-1	...half a mile...stick it...it's right in the middle of		
12:51:20.0 HOT-1	the world's kinda neat		
12:51:23.6 HOT-2	have you not looked ** yet		
		12:51:24.8 APR	Gulftest one six fly heading two zero zero
		12:51:27.6 RDO-2	two zero zero Gulftest one six
12:51:29.2 HOT-1	have you not been up there yet? you need to go man it's worth the tour it's pretty cool		
12:51:32.9 HOT-1	they let you walk on the field...or you know put your feet on the grass whatever...they don't let you get too far		
12:51:47.2 HOT-1	packer fan I'm not a packer fan [singing, yawning]		
12:51:52.9 HOT-2	I wish Dan Marino would have gotta Super Bowl ring		
12:51:56.0 HOT-1	yeh that's too bad he was a great quarter back man		
12:52:01.2 HOT-2	it was neat because he he played in the Dolphins		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:52:03.5 HOT-1	he never left the Dolphins did he?		
12:52:05.4 HOT-2	yeah he had this huge family I think he adopted a lot...		
12:52:09.0 HOT-1	yeah		
12:52:09.5 HOT-2	...and their family I mean their roots for his big family is there in Miami...		
12:52:13.3 HOT-1	yeah		
12:52:13.8 HOT-2	and he wasn't about to move them		
12:52:15.2 HOT-1	yeah		
12:52:16.0 HOT-1	he * grew up in Pennsylvania he's a Pennsylvania boy		
12:52:17.9 HOT-2	yep I remember him beatin' Georgia and Herschel Walker in the Sugar Bowl for the national championship		
12:52:21.2 HOT-1	yep		
12:52:23.9 HOT-1	did he win a national championship?		
12:52:25.4 HOT-2	yeah		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:52:26.5 HOT-2	he had to beat Georgia to do it		
12:52:26.5 HOT-1	*		
12:52:28.4 HOT-1	yep		
12:52:31.3 HOT-1	Georgia		
12:52:39.7 HOT-1	Georgia Georgia [singing]		
12:52:51.9 HOT-1	all of our trips into Canada...there was a * fan who was my taxi driver...and he asked where we were from...we told him Georgia and he went right into a little Ray Charles...Georgia		
12:53:04.1 HOT-2	[humming tune]		
12:53:06.0 HOT-2	Georgia [singing]		
12:53:07.0 HOT-1	look at the big ole' windmills out here		
12:53:08.6 HOT-2	yep		
12:53:11.3 HOT-1	they aren't spinnin' much for...this much weather we got goin'		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:53:32.1 HOT-1	I got I got some towers on the nose man		
12:53:36.0 HOT-2	man check it out		
12:53:37.1 HOT-1	we're below the minimum safe...we're right at the minimum safe altitude		
12:53:42.6 HOT-2	watch em' come up here		
12:53:48.3 HOT-2	there they are		
12:53:49.9 HOT-1	yep		
12:53:53.6 HOT-1	little tower farm		
		12:53:58.8 APR	Gulftest one six turn right heading two four zero
		12:54:01.6 RDO-2	right two four zero Gulftest one six
12:54:06.9 HOT-1	two forty		
12:54:08.7 HOT-2	* GreenBay approach...one...it's gonna be eighteen seven for tower I'm going to put that on deck		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:54:15.6 HOT-1	see usually about right here * you know @ will start hand flying he'll * start you know put his hand on the yoke		
12:54:24.1 HOT-2	the one the one that really bothers me is his feet actually on the rudder pedals moving 'em		
12:54:28.4 HOT-1	yeah		
12:54:29.4 HOT-2	and and you know		
12:54:31.0 HOT-2	before we fly again I must say hey @ don't do that		
12:54:34.1 HOT-2	and you know @ is going to be @		
12:54:35.9 HOT-1	oh he's gonna be mad		
12:54:37.2 HOT-2	oh he'll be mad		
12:54:37.8 HOT-1	he'll go oh woah woah...I'll just say I won't fly with you again that's fine		
12:54:42.2 HOT-2	yep exactly		
12:54:44.3 HOT-2	he's somebody else he's somebody else I wish would go away		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:54:49.2 **HOT-1**	yeah		
12:54:51.5 **HOT-2**	he's such a Jekyll and Hyde @		
12:54:52.8 **HOT-1**	yeah		
12:55:04.5 **HOT-1**	how about them packers [imitating voice]		
12:55:11.6 **HOT-2**	and he's...he's the type who would say if you knew how to land in a crosswind I wouldn't need to		
12:55:15.9 **HOT-1**	yeah		
12:55:17.8 **HOT-2**	and		
12:55:20.3 **HOT-2**	I was tryin' to say I'd do a lot better landing in a crosswind if you weren't ridin' the friggin' rudder pedals		
12:55:26.7 **HOT-1**	yeah		
12:55:27.1 **HOT-1**	you have the confidence to fly with me or not if you don't go to @ and tell him you don't want to fly with me		
12:55:31.9 **HOT-1**	I don't want you ridin' my damned rudder pedals		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:55:33.0 HOT	[sound of single high pitch tone]		
12:55:37.0 HOT-1	how about some flaps to ten		
12:55:38.5 HOT-2	good speed selected captain		
12:55:40.0 HOT	[sound of click, similar to flap handle]		
12:55:42.1 HOT-1	that's good (knucklerooskie)		
12:55:43.7 HOT-2	we'll do a too low gear too low flaps		
12:55:45.3 HOT-1	yes sir		
12:55:47.1 HOT-1	and I'll remember to add power		
12:55:49.3 HOT-1	and I'll be very care...cognizant of the trim		
12:55:52.3 HOT-1	make sure he doesn't take us on a ride on that go around		
12:56:00.1 HOT-1	check the motor runnin' headin' down the highway [singing]		
12:56:07.9 HOT-1	there's that		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:56:08.6 HOT-2	lookin' for adventure [singing]		
12:56:10.6 HOT-2	for whatever comes my way [singing]		
12:56:12.8 HOT-1	there's that ah acoustic door chattering again		
12:56:18.2 HOT-1	how about a turn there double dog		
12:56:21.6 HOT-2	okay are you ready for the approach...I'm with yah		
12:56:24.4 HOT-1	is this guy gonna turn us or what?		
12:56:37.2 HOT-1	whatever		
		12:56:39.2 RDO-2	Greenbay Gulftest one six you still with us?
12:56:48.1 HOT-2	one nineteen five right?		
12:56:50.1 HOT-1	yep		
		12:56:51.0 RDO-2	Greenbay Gulftest one six
12:56:57.3 HOT-2	nineteen four		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
		12:57:02.7 **RDO-2**	Greenbay approach Gulftest one six
		12:57:06.6 **APR**	Gulftest one six thank you turn right heading of zero three zero join the localizer
		12:57:12.5 **RDO-2**	right zero three zero join the localizer. ahh what happened there with the freq?
		12:57:15.9 **APR**	Gulftest one six my apologies I forgot to change over to nineteen four
		12:57:19.4 **RDO-2**	no problem
12:57:20.4 **HOT-1**	zero what?		
12:57:21.6 **HOT-2**	three zero		
12:57:22.8 **HOT-1**	zero three zero		
12:57:25.7 **HOT-2**	wasn't that pretty dang good of me to look up here and know that approach		
12:57:28.6 **HOT-1**	that was friggin' **		
12:57:30.1 **HOT-2**	saved the day		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:57:31.6 HOT-1	that was impressive how about flaps twenty		
12:57:33.5 HOT-2	good speed selected captain		
12:57:34.8 HOT	[sound of click, similar to flap handle]		
12:57:35.5 HOT-1	see if we can unscrew this guy		
12:57:39.9 HOT-2	just now come'n across the I-L-S on my side		
12:57:49.1 HOT-1	overshot slightly		
12:57:55.5 HOT-2	I *** on the radios here...oh dude I got something totally different I gotta go one oh nine nine here		
12:58:02.1 HOT-2	there we go		
12:58:03.2 HOT	[sound of single chime, similar to advisory condition]		
12:58:04.0 HOT-1	it just kicked off		
12:58:05.9 HOT	[sound of double chime, similar to master caution]		
12:58:07.6 HOT	[sound of double chime, similar to master caution]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:58:14.4 **HOT-1**	that's not good		
12:58:26.6 **HOT-1**	it's not likin'...big trim changes		
		12:58:30.1 **APR**	Gulftest one six four miles from DEPRE cleared I-L-S runway three six approach contact tower one one eight point seven we'll talk to you soon
		12:58:38.2 **RDO-2**	cleared I-L-S goin' to tower Gulftest one six
12:58:41.6 **HOT-1**	got green got localizer		
		12:58:43.9 **RDO-2**	tower Gulftest one six with you outside DEPRE for the I-L-S three six
		12:58:48.4 **TWR**	Gulftest one six Green Bay tower runway three six cleared for the option
		12:58:52.4 **RDO-2**	copy and we are going to be delayed gear for test purposes
		12:58:56.6 **TWR**	Gulftest one six roger
12:59:01.1 **HOT-2**	I'll ask for a climbout here too in a bit		
12:59:02.8 **HOT-1**	yeah		
		12:59:08.1 **RDO-2**	Gulftest one six do you have any climbout instructions for us

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
		12:59:11.6 **TWR**	Gulftest one six on the go turn left heading two four zero maintain three thousand
12:59:15.9 **HOT**	[sound of outer marker increasing in intensity until 1300:11.5]		
		12:59:16.3 **RDO-2**	two four zero maintain three thousand Gulftest one six
12:59:19.4 **HOT-2**	two four zero three thousand is set in the box		
12:59:21.6 **HOT-1**	okay woppin' left turn		
12:59:30.8 **HOT-2**	auto * it worked...auto course transfer...two thousand feet HUD...airport symbol you got it?		
12:59:37.5 **HOT-1**	uhhhmmm...not yet. yeh it is it's there		
12:59:43.3 **HOT-2**	okay there you go		
12:59:44.3 **HOT-2**	outer marker		
12:59:46.0 **HOT-1**	it's just way		
12:59:50.0 **HOT-1**	yeah I hear it. you hear it?		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
12:59:51.6 HOT-2	I hear it		
12:59:52.1 HOT-1	yeah		
12:59:55.3 HOT-2	lookin' for the visual signal we got the standby		
13:00:10.0 HOT-2	there it is		
13:00:11.2 HOT	[sound of outer marker decreasing in intensity until 1300:50.5]		
13:00:41.0 HOT-2	goin' to approach mode		
13:00:43.5 HOT-2	localizer and glide slope tracking is good		
13:00:49.0 HOT-2	how's your E-V-S lookin'?		
13:00:50.4 HOT-1	ahh it's workin'		
13:00:52.6 HOT-2	look for the HUD symbol down here		
13:00:54.1 EGPWS	one thousand		
13:00:55.0 HOT-1	yeah		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:00:55.8 HOT-2	too low gear and too low flaps and all that good jazz		
13:01:01.7 HOT-2	and we should get...the auto transfer...back to...if you don't mind that should go automatically back to F-M-S		
13:01:11.0 HOT-1	yeah		
13:01:32.4 EGPWS	five hundred		
13:01:34.4 EGPWS	too low gear		
13:01:35.5 HOT-2	first one captain		
13:01:37.4 HOT	[sound of three tones, similar to autothrottle disconnect]		
13:01:40.9 EGPWS	four hundred		
13:01:43.4 EGPWS	too low gear		
13:01:44.8 HOT	[sound of alternating high low tone, similar to gear configuration warning]		
13:01:45.6 EGPWS	three hundred		
13:01:46.6 HOT-?	gear		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:01:47.1 CAM	[sound of increased ambient noise, similar to gear extension]		
13:01:47.2 EGPWS	too low gear		
13:01:50.0 EGPWS	approaching minimums		
13:01:54.2 EGPWS	too low flaps		
13:01:56.2 EGPWS	minimums		
13:01:57.0 HOT	[sound of single high pitch tone]		
13:01:57.4 HOT-1	it's comin' uuuuuuup		
13:01:57.9 EGPWS	two hundred		
13:01:59.5 HOT-1	positive rate gear		
13:02:01.0 HOT-2	gear's comin' up		
13:02:02.3 HOT-2	want your flaps?		
13:02:03.6 HOT-1	yep flaps		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:02:04.6 HOT-2	come'n up and it switched over okay we are going to go heading...		
13:02:08.3 HOT-1	okay wait wait wait just wait a second or else it just gonna do a big bad turn		
13:02:12.5 HOT-1	okay		
13:02:13.6 HOT-2	heading and felch		
13:02:15.4 HOT-1	alright		
		13:02:16.9 RDO-2	Gulftest one six on the go
13:02:19.8 HOT	[sound of low pitch tone, similar to altitude alert]		
		13:02:24.6 TWR	Gulfteston one six roger you're cleared to the Appleton airport turn left heading one eight zero now
13:02:27.0 HOT	[sound of single chime, similar to advisory message]		
13:02:29.9 HOT	[sound of double chime, similar to master caution]		
		13:02:30.5 RDO-2	turn left heading one eight zero Gulftest one six
13:02:31.7 HOT	[sound of double chime, similar to master caution]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:02:32.3 HOT-1	*		
13:02:33.5 HOT-2	okay		
13:02:34.2 HOT	[sound of single chime, similar to advisory message]		
13:02:36.9 HOT	[sound of double chime, similar to master caution]		
13:02:39.3 HOT	[sound of single chime, similar to advisory message]		
13:02:42.0 HOT	[sound of double chime, similar to master caution]		
13:02:44.6 HOT-1	see it didn't hack that either		
13:02:51.1 HOT-1	so I was trying to be as nice as possible		
		13:03:10.4 TWR	Gulftest one six contact departure one one niner point four
		13:03:13.3 RDO-2	nineteen four Gulftest one six
		13:03:21.6 RDO-2	Gulftest one six with you at three thousand feet turnin' left one eight zero
		13:03:25.1 APR	Gulftest one six Green Bay departure radar contact proceed direct SUDIE did you want higher

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
		13:03:32.2 **RDO-2**	naw this should be fine
		13:03:33.4 **APR**	Gulftest one six roger
13:03:35.1 **HOT-1**	L-nav		
13:03:36.0 **HOT-2**	okay * is available		
13:03:41.1 **HOT-1**	let's go...mind goin' to your map real quick and just make sure we are going (that) way		
13:03:44.1 **HOT-2**	yep		
13:03:49.9 **HOT-1**	look's good to me		
13:03:52.1 **HOT-1**	did you notice how the ah the autopilot didn't didn't hack the the ah...		
13:03:56.2 **HOT-2**	yeah there is something when you push the limits for the speed and the pitch		
13:03:59.2 **HOT-1**	yeah the trim the trim is not keepin' up		
13:04:01.8 **HOT-2**	marker beacon can come off		
13:04:06.1 **HOT-1**	yeah we would have blown through that altitude big time		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:04:08.8 HOT-1	[laughter]		
13:04:11.6 HOT-1	if not for my superior aviator skills		
13:04:13.8 HOT-2	oh I thought it kicked off by itself		
13:04:15.5 HOT-1	it did		
13:04:16.6 HOT-2	okay		
13:04:17.6 HOT-1	but it did with the nose friggin' jacked up way in the air		
13:04:22.3 HOT-1	I'm just sayin' if I didn't grab it...and friggin'...come down with it		
13:04:32.3 HOT-1	we may be we may be here an extra day		
13:04:34.1 HOT-2	I know that's what I was just thinking		
13:04:36.2 HOT-1	[laughter]		
13:04:36.7 HOT-2	uhm that one's a weird one		
13:04:38.3 HOT-1	there		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
		13:04:40.0 APR-A	Gulftest one six how will this approach terminate
13:04:43.0 HOT-2	wanna do the V-O-R too?		
13:04:44.1 HOT-1	no...I'm ready to land		
		13:04:45.4 RDO-2	it will be a full stop for Gulftest one six
13:04:47.1 HOT-1	you do go I-L-S		
		13:04:47.5 APR-A	* one six roger maintain three thousand until established on a published segment of the approach cleared r-nav G-P-S runway three zero approach Appleton
		13:04:55.3 RDO-2	three thousand until established on a segment cleared r-nav G-P-S three zero approach at Appleton Gulftest one six
13:05:01.1 HOT-1	I don't wanna do anymore go arounds with this autopilot		
13:05:03.9 HOT-2	okay		
13:05:06.8 HOT-2	I be scared		
13:05:08.3 HOT-1	I ain't scared		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:05:09.6 HOT-1	I'm just hungry		
13:05:11.3 HOT-1	[laughter]		
13:05:14.9 HOT-1	[imitating a voice] I ain't scared I'm just hungry		
13:05:17.9 HOT-2	R-N-P three point zero		
13:05:19.5 HOT-1	what are the winds man you givin' me like a direct crosswind here or what what do we got goin' here		
13:05:24.0 HOT-2	the winds are three four zero at ten		
13:05:27.0 HOT-1	oh lordy...that's heinous		
13:05:29.5 HOT-1	what runway we landing on?		
13:05:33.0 HOT-1	###		
13:05:41.4 HOT-2	by the way minimums--		
13:05:42.7 HOT-1	###		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:05:45.7 HOT-1	I don't worry about so much about minimums when I when its clear and ah frickin' million *		
13:05:49.6 HOT-2	be L-P-V of ten seventy five		
13:05:51.5 HOT-1	ten seventy five		
13:05:55.4 HOT-1	I'm gonna go ten seventy 'cause I'm a risk taker		
13:05:58.7 HOT-2	we're in nav--		
		13:05:59.8 APR-A	Gulftest one six Appleton airport information Mike is current the winds...three four zero at eight and the ah visibility...correction...ah altimeter three zero one two
		13:06:13.2 RDO-2	three zero one two we got Mike Gulftest one six
13:06:15.7 HOT-1	one two set left center		
13:06:19.3 HOT-2	we're supposed to go to eight eighty on the touchdown zone elevation I'll take care of that for you so you don't prang the landing		
13:06:24.3 HOT-1	oh okay nice		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:06:30.8 HOT-2	I needa' check the ah auto...re...auto throttle retard and ah max thrust reverser		
13:06:47.7 HOT-2	and uhm and thrust reverser and anti-skid		
13:06:50.9 HOT-1	okay		
13:07:02.6 HOT-1	so just tap my hands when you've got thrust reversers and then I'll come on the brakes		
13:07:06.1 HOT-2	checks good L-P-V that checks good		
13:07:11.1 HOT-1	there they are		
13:07:21.2 HOT-1	flaps ten		
13:07:22.4 HOT-2	good speed selected		
13:07:23.9 HOT	[sound of click, similar to flap handle movement]		
13:07:24.4 HOT-2	missed approach is going to be twenty six you want me to set that?		
13:07:24.5 CAM	[background sound increase, similar to association with flap extension]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:07:26.5 HOT-1	yeah sure why not		
		13:07:29.5 APR-A	[advisory to other aircraft of possible geese in the area]
13:07:31.6 HOT-1	another *		
13:07:33.2 HOT	[sound of low pitch tone, similar to altitude alert]		
13:07:38.4 HOT-1	[imitating a voice] could possibly be geese...don't let 'em # on yah		
13:07:45.4 HOT-1	geese man what the hell		
13:07:49.9 HOT-2	let's say you hit those geese and we had no engines where would you land? on the lake right there?		
13:07:53.8 HOT-1	yeah I think so		
13:07:54.8 HOT-2	see all those folks fishin' out there		
13:07:56.3 HOT-1	yep		
13:07:59.5 HOT-1	we may hit one or two of them		
13:08:01.2 HOT-1	I'd rather hit one of them than a tree though		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:08:06.4 HOT-2	actually I wouldn't land there...there are too many huts too many people fishin'...pick a spot where you miss em'...you think the ice would hold this airplane up?		
13:08:13.1 HOT-1	boy you'd have to land pretty damn smooth		
13:08:15.9 HOT-1	flaps twenty		
13:08:17.2 HOT-2	good speed selected captain		
13:08:18.4 HOT	[sound of click, similar to flap handle movement]		
13:08:20.1 HOT-1	this is place where it kicked off the trim didn't keep up with the		
13:08:24.2 HOT-2	I think they gotta' change somethin' with the trim...motors actuators...control boxes		
13:08:31.0 HOT-1	somein' what about that		
13:08:35.7 HOT	[sound of single tone, similar to advisory message]		
13:08:37.7 HOT-2	alotta ice fishin' goin' on		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:08:39.5 **HOT-1**	yep just and okay catch little bitty # fish too don't they ice fishin'...ain't like they are pullin' out friggin' Carp or big ole' Walleye or maybe are I don't know...just cool--		
		13:08:51.4 **APR-A**	Gulftest one six contact Appleton tower one one niner point six goodday sir
		13:08:56.0 **RDO-2**	goin' to tower goodday Gulftest one six
		13:08:59.5 **RDO-2**	Appleton tower Gulftest one six just inside of APESE full stop three zero on the r-nav G-P-S
		13:09:07.5 **TWR**	Gulftest one six Appleton tower good afternoon runway three zero winds are three four zero at eight cleared to land off Embraer jet traffic departing runway three zero prior to your arrival
		13:09:16.9 **RDO-2**	cleared to land lookin' for the traffic Gulftest one six
13:09:20.5 **HOT-1**	there out there in in their cars though		
13:09:23.0 **HOT-2**	are they		
13:09:23.6 **HOT-1**	yeah		
13:09:26.6 **HOT-2**	shoot dude we could turn left here land it right here next to land on the ice and just scream it in and walk right away		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:09:33.2 **HOT-1**	yep		
		13:09:35.2 **TWR**	Appleton altimeter is now three zero one two
13:09:40.1 **HOT-1**	three zero one two I already got that		
13:09:49.5 **HOT-1**	that's pretty good I'll let you dick with it tomorrow		
13:10:12.4 **HOT-2**	V-G-Ps comin' in		
13:10:14.5 **HOT-1**	yep that be decent		
13:10:22.7 **HOT-1**	are these like little race tracks they have for snowmobiles		
13:10:24.8 **HOT-2**	yeah they're snowmobiles I don't know about the other yeah		
13:10:28.0 **HOT-2**	I'll bet they are		
13:10:31.1 **HOT-1**	I think they slip off to where it's just ice though		
13:10:36.8 **HOT-1**	uh that's snow		
13:10:41.0 **HOT-1**	uh seems like we are a mile away how about some gear		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:10:42.9 CAM	[sound of increased noise, similar to association with gear extension]		
13:10:43.0 HOT-3	[sound of click, similar to gear handle]		
13:10:44.0 HOT-3	[sound of click]		
13:10:47.4 HOT-3	[sound of click]		
13:10:48.5 HOT-3	[sound of click]		
13:10:51.0 HOT-1	maybe they're motorcycles with the ah with the spikes on em' you know what I mean		
13:10:56.3 HOT-1	[imitating motorcycle sound]		
13:10:57.1 HOT-1	that's pretty cool		
13:10:59.0 HOT-2	alright so I'm doin' pretty well I'm gonna mark it off good		
13:11:03.2 HOT-2	approach annunciation		
13:11:09.9 HOT-1	hydraulic quantity low		
13:11:12.8 HOT-1	how'd that happen		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:11:14.6 HOT-1	when it was heavy when it was full too		
13:11:18.1 HOT-1	oh lordy		
13:11:19.6 HOT-1	that ain't good		
13:11:21.1 HOT-2	kay		
13:11:23.5 HOT-2	let's...your right let's don't do that ah V-O-R approach		
13:11:27.6 HOT-2	we have a hydraulic...we gotta hydraulic leak		
13:11:29.6 HOT-1	yeh we gotta leak		
13:11:30.4 HOT-2	there you go right there		
13:11:32.3 HOT-2	yaw damper one fail		
13:11:34.0 HOT-2	what are we gonna have for brakes		
13:11:36.4 HOT-2	we got F (two) one and one we got the right thrust reverser		
13:11:41.3 HOT-2	radio altimeter speed brakes landing gear I'll put I'll get all this stuff later...let's just do a normal landing with no anti-skid or anything like that okay		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:11:46.8 HOT-1	yep		
13:11:47.2 HOT-2	I'm gonna put this away I'm gonna I'm gonna take a look at this and the checklist real quick		
13:11:50.0 HOT-1	okay		
13:11:50.8 HOT-1	can I go flaps full?		
13:11:52.6 HOT-1	will they move or are we done?		
13:11:53.9 HOT-2	I think we're done		
13:11:55.0 HOT-2	let's see here		
13:11:55.7 HOT-3	[sound of click]		
13:11:59.9 HOT-2	they're not movin'		
13:12:01.9 HOT-2	puttin' em back to twenty degrees		
13:12:02.1 HOT-3	[sound of click]		
13:12:03.5 HOT-1	okay		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:12:04.7 **HOT-2**	let me ah take a look at this real quick		
13:12:10.2 **HOT-2**	we have a left ah system fail right now		
13:12:12.5 **HOT-1**	yep		
13:12:13.8 **EGPWS**	one thousand		
		13:12:14.7 **TWR**	...Gulfstream on a three mile final for three zero
13:12:17.8 **HOT-2**	should we go around to check it out?		
13:12:19.5 **HOT-1**	no...we're gonna land cause it's leakin'		
13:12:20.8 **HOT-2**	we're gonna need thirty eight		
13:12:23.7 **HOT-1**	just tell me our brake situation		
13:12:30.4 **HOT-2**	check hydraulic [mutter] if leak is evident see left system hydraulic for loss of pressure		
13:12:34.9 **HOT-2**	for loss of system pressure only...it says system fail...E-E fourteen		
13:12:43.7 **HOT**	[sound of low/high/low tone triple chime, similar to autopilot disconnect]		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:12:49.4 EGPWS	five hundred		
13:12:50.9 HOT-2	right system...left system failure		
13:12:57.9 EGPWS	four hundred		
13:13:00.4 EGPWS	approaching minimums		
13:13:01.5 HOT-2	I wonder if we should ah		
13:13:03.0 HOT-2	P-T not arm		
13:13:04.4 EGPWS	three hundred		
13:13:05.3 HOT-2	pull that aux pump...		
13:13:06.5 EGPWS	minimums		
13:13:07.1 HOT-2	...* thirty seconds		
13:13:08.5 EGPWS	too low flaps		
13:13:09.1 HOT-1	yep		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:13:09.7 **HOT-1**	yep		
13:13:10.8 **EGPWS**	two hundred		
13:13:11.9 **HOT-1**	silence the flaps		
13:13:12.7 **EGPWS**	too low flaps		
13:13:14.7 **HOT-2**	okay		
13:13:15.0 **EGPWS**	too low flaps		
13:13:15.8 **HOT**	[sound of three high pitch tones, similar to autothrottle disconnect]		
13:13:19.2 **EGPWS**	fifty forty thirty twenty ten		
13:13:28.7 **HOT-2**	[sound of rattling]		
13:13:31.4 **HOT**	[sound of click, similar to landing gear lock release button auto engagement]		
		13:13:33.1 **RAAS**	three thousand remaining
13:13:34.1 **HOT-1**	come on baby come down		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:13:35.7 **CAM**	[change in background sound to lower pitch rumble, similar to association of sound with nose gear on runway]		
13:13:37.7 **HOT-2**	you need the thrust reverser		
		13:13:38.8 **RAAS**	two thousand remaining
13:13:40.0 **HOT-2**	you got any brakes?		
13:13:41.1 **HOT-1**	no		
13:13:41.6 **HOT-2**	no? [emphasized]		
13:13:42.2 **HOT-1**	no let's go around		
13:13:43.0 **HOT-2**	don't go around okay		
		13:13:44.3 **RAAS**	one thousand...
13:13:44.6 **HOT**	[sound of triple chime, similar to master warning]		
13:13:45.2 **HOT-?**	oh #		
		13:13:45.6 **RAAS**	...remaining

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:13:46.2 HOT-1	we're good we're good we're good		
13:13:47.5 HOT-2	no we're not it's only a hundred knots man		
13:13:47.6 HOT	[sound of triple chime, similar to master warning]		
13:13:49.2 HOT-1	yes we're goin'		
13:13:50.0 HOT-1	no @ we're goin' around		
13:13:50.6 HOT	[sound of triple chime, similar to red master warning]		
13:13:51.1 HOT-2	no we can't...stop		
		13:13:52.5 RDO-2	uh we're goin' off the runway for Gulftest one six
13:13:56.3 CAM	[increasing rumbling noise, similar to off pavement]		
13:13:56.6 HOT-2	dear Lord please be with us		
		13:14:03.2 TWR	** on the crash phone now
13:14:03.4 HOT-1	hang on hang on		

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:14:05.1 HOT-1	hang on		
13:14:06.7 HOT-1	hang on		
13:14:09.8 HOT	[sound of alternating high/low tone, similar to configuration warning, continues until 1314:18.5]		
13:14:18.6 HOT-3	you guys alright		
13:14:20.2 HOT-2	let's get out		
13:14:21.5 CAM	yo		
13:14:22.1 CAM	get out		
13:14:22.7 CAM	come on		
13:14:23.3 HOT-1	hurry up		
13:14:24.1 CAM	doors open		
13:14:25.1 HOT	[sound of rattling, similar to headsets coming off]		
		13:14:32.3 TWR	Gulftest you guys alright

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:14:34.0 HOT-3	it collapsed on us		
13:14:37.2 HOT	[sound similar to squeaking]		
		13:14:42.9 TWR	* airfield * Appleton
13:14:42.9 HOT	[sound of set of 4 tone sequence, alternating high/low pitch, continues until 1319:55.5 (when cancelled by crew)]		
13:14:54.1 HOT	[sound of triple chime, similar to warning message, continues until 1319:52.5 (when cancelled by crew)]		
		13:15:48.9 ARFF	[ARFF calls TWR]
		13:15:51.8 TWR	[communicates with ARFF directing to overrun Gulfstream aircraft]
		13:16:01.2 TWR	*
		13:16:40.8 TWR	[Tower communicates with ARFF about aircraft]
		13:17:54.2 TWR	Airport eighty two tower
		13:18:02.7 ARFF	this is eighty two go ahead

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
		13:18:05.8 TWR	Airport eighty two did you see anybody get out of the aircraft
		13:18:08.8 ARFF	*** aircraft *** I don't know if I can get to it right now with this truck from here
		13:18:17.5 ARFF	have you talked to them is anyone injured or anything
		13:18:20.3 TWR	*** I did not get a response *** believe * doors open *** is that correct
		13:18:28.6 ARFF	*** seems intact ***
		13:18:34.5 TWR	* is there anyway you can walk from the truck to * the aircraft
		13:18:40.0 ARFF	*** I'm going to park the truck here and ah *** see what's goin' on
		13:18:46.2 TWR	*** okay ***
		13:18:51.7 TWR	Airport eighty three *** proceed west on alpha cross runway three *** to the approach end of runway one two
		13:19:01.0 ARFF	* we go around the perimeter *
		13:19:08.7 TWR	* perimeter road *

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
		13:19:18.9 **TWR**	* Airport eighty three is there a quicker way to get to *** perimeter road than going all the way around ***
		13:19:26.5 **ARFF**	* can I get there anyway quicker ***
13:19:35.4 **CAM**	[sounds similar to door] [sound similar to muffled voices]		
13:19:46.1 **HOT**	yeh		
13:19:46.8 **HOT**	[sound of squeak]		
13:19:54.5 **CAM**	not anything in the baggage correct		
13:20:01.2 **CAM**	ahh #		
13:20:05.7 **CAM-3**	this could of ended up a lot worse boss * you were friggin' outstanding		
13:20:14.3 **CAM-3**	whatever it was it wasn't you		
13:20:16.8 **CAM-1**	well		
13:20:31.5 **CAM-3**	so I gotta ask first?		
		13:20:42.1 **TWR**	[tower speaks to ARFF responding to overrun]

TIME and SOURCE	INTRA-COCKPIT COMMUNICATION CONTENT	TIME and SOURCE	AIR-GROUND COMMUNICATION CONTENT
13:20:47.8 CAM-3	is there anything is there anything I need to know is there anything--		
13:20:51.9 CAM-2	let's get off the plane and we'll talk about it		
13:20:54.0 CAM-2	[various unintelligible conversations exiting cockpit, various parties]		
13:21:41.3 CAM	[sound of sirens increasing in intensity]		
13:22:06.5 CAM	[sound of squeaking]		
13:22:50.7 CAM	[sound similar to vehicle pulling up to aircraft]		
13:22:58.8 CAM	gentlemen how are we doing		
13:23:04.9 CAM	[unintelligible conversation associated with ARFF personnel]		
13:23:27.1 CAM	[various unintelligible conversations, similar to ARFF on or near plane]		
13:31:03.4 CAM	[end of recording]		
13:31:08.6 END OF TRANSCRIPT END OF RECORDING			