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

GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

CEN17MA183

By
Bill Tuccio, Ph.D.

WARNING

The reader of this report is cautioned that the transcript of a cockpit voice recorder audio recording is not a precise science but is the best product possible from a Safety Board group investigative effort. The transcript or parts thereof, if taken out of context, could be misleading. The transcript should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the transcript as the sole source of information.

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

August 23, 2017

Cockpit Voice Recorder

Group Chairman's Factual Report
By Bill Tuccio, Ph.D.

1. EVENT SUMMARY

Location:	Teterboro, New Jersey
Date:	May 15, 2017
Aircraft:	Gates Learjet 35A, Registration N452DA
Operator:	Trans-Pacific Jets
NTSB Number:	CEN17MA183

On May 15, 2017, at 1529 eastern daylight time (EDT), a Gates Learjet 35A, N452DA, operated by Trans-Pacific Air Charter LLC doing business as Trans-Pacific Jets, departed controlled flight while on a circling approach to runway 1 at the Teterboro Airport (TEB), Teterboro, New Jersey, and impacted a commercial building and parking lot. The captain and first officer died; no one on the ground was injured. The airplane was destroyed by impact forces and postcrash fire. The airplane was registered to A&C Big Sky Aviation LLC and operated by Trans-Pacific Air Charter LLC under the provisions of *14 Code of Federal Regulations* (CFR) Part 91 as a positioning flight. Visual meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed. The flight departed from the Philadelphia International Airport (PHL), Philadelphia, Pennsylvania, about 1504 and was destined for TEB. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Division for evaluation. The CVR group meeting convened on May 31, 2017, and a transcript was prepared for the 30-minute digital recording (see attached).

2. GROUP

Assistant Group Chairman:	Sean Payne Mechanical Engineer NTSB
Member:	David Gerlach Senior Air Safety Investigator Federal Aviation Administration
Member:	Jonathan Berges Chief Pilot Trans-Pacific Jets

Member:	Gary Spears Senior Test Pilot Bombardier

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model:	**Universal CVR-30**[1]
Recorder Serial Number:	**Unknown**

3.1 CVR Carriage Requirements

Per federal regulation 14 CFR 91.609(e), multiengine, turbine-powered airplanes having a passenger seating configuration of six passengers or more and for which two pilots are required by type certification must be equipped with a CVR that records a minimum of the last 30 minutes 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 30 minutes of CVR operation.

3.2 Recorder Description

This model CVR, the Universal CVR-30, records a minimum of 30 minutes of digital audio stored on solid state memory modules. Four channels are recorded: one channel for each flight crew, one channel for a cockpit observer, and one channel for the cockpit area microphone (CAM).

3.3 Recorder Damage

Upon arrival at the NTSB Vehicle Recorder Division, it was evident that the CVR had sustained heat and structural damage, as shown in figure 1. The outer case was removed and the interior Crash Survivable Memory Unit (CSMU) was removed, which evidenced heat exposure, as shown in figure 2. The memory board was removed from the protective material inside the CSMU, as shown in figures 3 and 4. The memory board was checked for heat or structural damage and none was found; however, there was residual fluid (mostly water) on the board. The board was cleaned with de-ionized, purified water, rinsed in alcohol, and then dried in a heated oven at 40° Celsius and a pressure of 14 inches of Mercury for about six hours. The two connecting wires, shown on the left side of the board in figure 4, were repaired and the digital audio was successfully downloaded from the memory board.

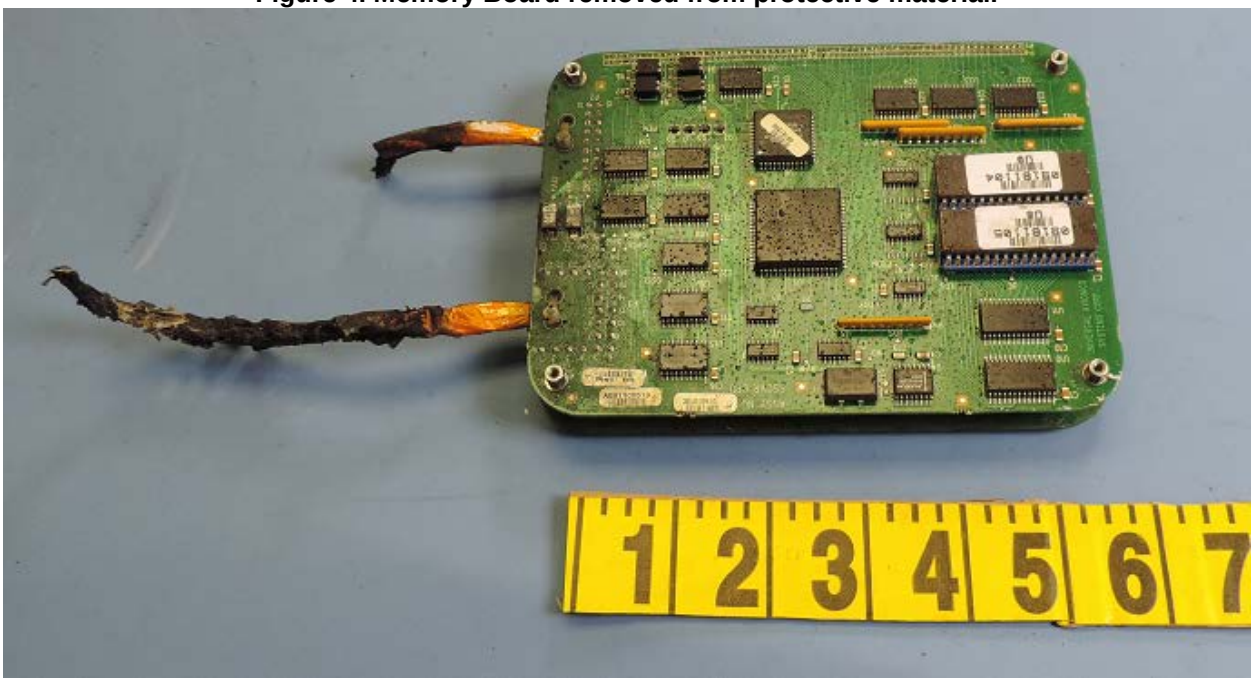
[1] It is possible the CVR was a CVR-30a; due to damage, the exact model could not be confirmed.

Figure 1. Universal CVR-30 as received.

Figure 2. CSMU removed from CVR.

Figure 3. Memory board being removed from protective material.

Figure 4. Memory Board removed from protective material.



3.4 Audio Recording Description

Each channel's audio quality is indicated in Table 1.[2]

[2] See attached CVR Quality Rating Scale.

Table 1: Audio Quality.

Channel Number	Content/Source	Quality	Duration
1	Unknown	Excellent	30 minutes
2	Second-in-Command	Excellent	30 minutes
3	Pilot-in-Command	Excellent	30 minutes
4	CAM	Excellent	30 minutes

3.5 Timing and Correlation

Timing on the transcript was established by correlating the air traffic control recording transmission time to the corresponding CVR event. Specifically, the CVR time of the final four radio transmissions from N452DA were compared to the transmissions recorded by the official Teterboro Tower recording, and all CVR events were offset to reflect the local EDT of the accident. The offset equation used was:

EDT = CVR Elapsed Time + 14-hours 57-minutes 43.5-seconds

3.6 Description of Audio Events

The recording began at 1459:44 EDT when the aircraft was holding short of runway 35 on the ground at PHL. The entire recording was transcribed.[3]

Other aircraft radio transmissions were transcribed when pertinent, including all radio communications with aircraft in and out of Teterboro. Additionally, throughout the flight there were nearly continuous communications by air traffic control and other aircraft that were not transcribed.

[3] The identification of pilot flying and pilot monitoring is not made in this report for this investigation; please see the public docket and/or analytical documents for this determination.

Attachment I

CVR Quality Rating Scale

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

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

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

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

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

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

Transcript of a Universal CVR-30 solid-state cockpit voice recorder, unknown serial number, installed on a Trans Pacific Jets Gates Learjet 35A (N452DA), which crashed during approach to land at Teterboro Airport in Teterboro, New Jersey.

LEGEND

CAM	Cockpit area microphone voice or sound source
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from N452DA
TWR-PHL	Radio transmission from Philadelphia airport tower controller
DEP-PHL	Radio transmission from Philadelphia Departure controller
APP-PHL	Radio transmission from Philadelphia Approach controller
APR-NYC	Radio transmission from the New York Approach controller
TWR-TEB	Radio transmission from the Teterboro airport tower controller
ATIS-TEB	Teterboro airport Automatic Terminal Information Service
AC-$$$	Radio transmission from a relevant aircraft (see note 5)
EGPWS	Enhanced Ground Proximity Warning System
-1	Voice identified as the pilot-in-command
-2	Voice identified as the second-in-command
-?	Voice unidentified
*	Unintelligible word
#	Expletive
@	Non-pertinent word
( )	Questionable insertion
[ ]	Editorial insertion
—	Cut-off in utterance

Note 1: Times are expressed in eastern daylight time (EDT).

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.

Note 5: $$$ is replaced in the transcript with a partial call-sign of the related aircraft; AC-UNK is used when the aircraft call sign could not be determined.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
14:59:44.4 EST **START OF RECORDING** **START OF TRANSCRIPT**			
14:59:44.4 **HOT-1**	[recording begins] —we uh go to five.		
14:59:46.4 **HOT-1**	or go to three.		
14:59:46.6 **HOT-2**	gotch'ya		
14:59:47.7 **HOT-1**	but we're only ten. ten.		
14:59:50.8 **HOT-1**	'kay he's waiting for everybody to clear the airspace. this guy's landing. that's why he's holding us.		
15:00:00.6 **HOT-1**	go. one oh eight ninety five. that's the localizer. we don't want that.		
15:00:04.1 **HOT-1**	twelve zip is North Philadelphia.		
15:00:06.9 **HOT**	[sound of multiple clicks]		
15:00:22.3 **HOT-1**	test. test. test. test. test. there's my volume.		
15:00:23.7 **HOT-2**	loud and clear.		
15:00:25.3 **HOT-1**	I've been have'n my volume all the way down for some stupid reason.		
15:00:29.0 **HOT-1**	test. test. test. talk to me.		
15:00:30.5 **HOT-2**	one two. one two. one two. one two.		
15:00:32.9 **HOT-1**	there we go.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:00:34.0 **HOT-(2)**	on the microphone.		
15:00:36.1 **HOT**	[sound of two static bursts, similar to VHF radio static noise]		
15:00:36.9 **HOT-2**	wow. look how slow he looks like he's goin'.		
15:00:39.0 **HOT-1**	I know. it's that # wind man. it's gusting to what the # was it gusting to? thirty-five?		
15:00:44.3 **HOT-2**	yeah.		
15:00:44.6 **HOT-1**	no. twenty five.		
15:00:46.6 **HOT-2**	Air Wisconsin.		
15:00:47.2 **HOT-1**	Air Wisconsin.		
15:00:48.6 **HOT-1**	weren't you uh doin' a # ground thing for em?		
15:00:50.8 **HOT-2**	yeah.		
15:00:51.6 **HOT-1**	okay I think we're next man. hand on your yoke.		
15:00:55.7 **HOT-1**	standing on the brakes. you got your handbrake. to— your parking brake is set.		
15:00:59.3 **HOT-2**	yes sir.		
15:01:05.8 **HOT-2**	go around.		
15:01:07.6 **HOT-2**	is it working?		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:01:07.6 **HOT-1**	yeah. it's supposed to disengage yeah but it's not. there we go. now it's disengage.		
15:01:12.9 **HOT-1**	ehhh. # it's not working.		
15:01:16.4 **HOT-1**	there we go. disengage.		
15:01:17.7 **CAM**	[sound of 1.2-second tone (480Hz increase to 560Hz), similar to yaw damper alert tone]		
15:01:22.6 **HOT-2**	look at that big boy.		
15:01:26.3 **HOT-1**	was that a crosswind landing?		
15:01:27.7 **HOT-2**	yeah it was.		
15:01:28.6 **HOT-1**	#.		
15:01:28.6 **HOT-2**	it had to be- look at that #.		
15:01:30.6 **HOT-1**	yeah.		
		15:01:33.4 **RDO-1**	and tower four five two delta alpha we're ready to go at three five.
		15:01:37.1 **TWR-PHL**	yeah just uh one more to land for (november) two delta alpha then we'll get you goin'. there just wasn't enough room with the two (separate) arrivals to squeeze ya out.
		15:01:43.8 **RDO-1**	not a problem.
15:01:44.8 **CAM**	[sound of click]		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:01:47.2 **HOT-2**	Frontier.		
15:01:52.4 **CAM**	[sound similar to cabin air flowing from cabin vents]		
15:01:53.6 **HOT-2**	wooo.		
15:01:54.3 **HOT-2**	that's that heat.		
15:02:01.0 **HOT-1**	okay. power setting was ninety-five?		
15:02:03.2 **HOT-2**	yeah.		
15:02:03.9 **HOT-1**	ninety-four nine?		
15:02:04.5 **HOT-2**	ninety-four five.		
15:02:10.9 **HOT-2**	I thought Frontier was come’n this way.		
15:02:14.6 **HOT-1**	three forty-nine. [exhale]		
15:02:22.7 **HOT-1**	there we go a little Pilatus. I guess we're gonna go after him.		
15:02:25.9 **HOT-1**	unless there's someone come'n in on two seven right.		
15:02:28.2 **HOT-2**	# Pilatuses		
15:02:30.2 **HOT-1**	aren't you glad you're not # with Pilatuses?		
15:02:32.2 **HOT-2**	I would have been captain though.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:02:37.3 **HOT-2**	he's gonna say line up and wait.		
15:02:39.7 **HOT-1**	stand by.		
		15:02:41.1 **TWR-PHL**	[Tower talks to a helicopter lacking a transponder code]
15:02:46.5 **HOT-1**	(ehhh) dude you're in a # controlled airspace.		
15:02:54.3 **HOT-1**	yeah bother the poor controller because you didn't get a clearance for V-F-R		
15:03:04.4 **HOT-1**	* four thirty-five.		
		15:03:06.6 **TWR-PHL**	november uh four five two delta alpha runway three five full length line up and wait traffic four out for runway ah two seven (right) I'll get ya goin' as soon as the runway's clear.
15:03:07.6 **HOT-1**	there we go.		
15:03:08.9 **CAM**	[sound of clicks]		
15:03:11.5 **HOT-1**	I'll get it.		
		15:03:14.2 **RDO-1**	alright. line up and wait three five. two delta alpha.
15:03:15.9 **CAM**	[sound of increase in engine thrust]		
15:03:17.2 **HOT-1**	get runway line ups. pitot heat. stall warning.		
15:03:21.3 **HOT-1**	** (heading).		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:03:24.8 **HOT-1**	gear lights are all done.		
15:03:26.0 **CAM**	[sound similar to engine igniters begins and continues through takeoff]		
15:03:26.3 **HOT-2**	yes sir.		
15:03:27.5 **HOT-1**	under the thumb sir.		
15:03:28.6 **HOT-2**	yeah I am. look.		
15:03:29.8 **HOT-1**	alright.		
15:03:31.5 **HOT-2**	I've been learning.		
15:03:33.3 **HOT-1**	power— power to idle.		
15:03:34.3 **CAM**	[sound similar to decrease in engine thrust]		
15:03:37.3 **CAM**	[sound of multiple thunks, similar to aircraft's landing gear taxiing over grooved surface, and continues during takeoff roll]		
		15:03:47.1 **TWR-PHL**	Lear four five two delta alpha just fly runway heading runway three five. clear for takeoff. traffic's three out for two seven right.
		15:03:52.3 **RDO-1**	alright. clear for takeoff three five. runway heading. two delta alpha so long.
15:03:57.1 **HOT-1**	alright ninety-five somethin'.		
15:03:59.6 **HOT-2**	ninety-five five.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:03:59.6 **CAM**	[sound similar to increase in engine thrust]		
15:04:01.0 **HOT-2**	ninety-four five.		
15:04:01.5 **HOT-1**	alright a little more. keep advancing it slowwwwly [emphasized] don't go crazy on it. little more. more. more. more.		
15:04:07.3 **HOT-1**	there ya go airspeeds set. airspeed's alive.		
15:04:10.1 **HOT-1**	airspeed alive. eighty knots crosscheck. I didn't say # V-one.		
15:04:13.6 **HOT-2**	yup.		
15:04:14.0 **HOT-1**	V-one [emphasized].		
15:04:16.2 **HOT-1**	rotate.		
15:04:18.2 **HOT-1**	slowwwwly. positive rate. gear up. yaw dampener engaged. ya gotta tell me to do that.		
15:04:22.0 **CAM**	[sound of clunk, similar to gear movement]		
15:04:22.7 **HOT-2**	yup.		
15:04:25.9 **CAM**	[sound of clunk, similar to gear door closing]		
15:04:26.5 **HOT-1**	there ya go.		
15:04:34.0 **HOT-1**	'kay four hundred feet.		
15:04:35.4 **HOT-2**	flaps up.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:04:36.5 **HOT-1**	after takeoff checks.		
15:04:37.7 **HOT-2**	yes sir.		
15:04:40.8 **HOT-1**	and if you'd like autopilot engaged you can go ahead and do so at this time.		
15:04:45.3 **HOT-2**	roger.		
15:04:45.7 **HOT-1**	it'll be off my heading.		
		15:04:46.4 **TWR-PHL**	(four) two delta alpha runway heading contact departure. have a good one.
		15:04:49.5 **RDO-1**	four. two delta alpha. so long.
15:04:53.9 **HOT-1**	'kay two thousand. one thousand to go.		
		15:04:57.7 **RDO-1**	and departure Lear jet four five two delta alpha out of one thousand for two thousand runway heading.
15:04:59.4 **CAM**	[sound of high pitch tone, similar to altitude alerter]		
		15:05:01.7 **DEP-PHL**	november four five two delta alpha. Philly departure radar contact.
15:05:02.1 **CAM**	[sound of click]		
15:05:05.8 **HOT-1**	ahhh. [spoken in almost a whisper]		
15:05:08.7 **HOT-2**	it's on right?		
15:05:09.8 **HOT-1**	uhhh it is now. yeah.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:05:11.9 **HOT-2**	okay.		
15:05:16.6 **HOT-1**	five hundred feet to go.		
15:05:17.9 **HOT-2**	roger.		
15:05:18.3 **HOT-1**	start trimmin' that thing nose down it'll punch right through two thousand.		
15:05:26.1 **HOT-1**	go ahead and turn off your uhhh...		
15:05:29.5 **HOT-1**	...(I have) nothing really. leave everything goin'.		
15:05:34.4 **HOT-1**	there ya go.		
		15:05:34.5 **DEP-PHL**	november two delta alpha climb to maintain four thousand and contact approach on one twenty three point eight.
		15:05:40.1 **RDO-1**	'kay. four thousand. twenty three point eight. four five two delta alpha so long.
15:05:46.1 **HOT-1**	up to four.		
15:05:46.9 **HOT-2**	up to four.		
		15:05:59.5 **RDO-1**	four five two delta alpha's out of two point five for four thousand runway heading.
		15:06:03.9 **APP-PHL**	november four five two delta alpha Philly approach altimeter is two niner eight one.
		15:06:07.7 **RDO-1**	two niner eight one.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:06:12.4 **CAM**	[sound of high pitch tone, similar to altitude alerter]		
15:06:13.5 **HOT-2**	one to go.		
15:06:13.6 **HOT-1**	one to go.		
15:06:14.8 **HOT-1**	trim that nose over.		
15:06:20.0 **HOT-1**	there ya go.		
15:06:22.1 **HOT-2**	smaaall.		
15:06:24.5 **HOT-2**	corrections.		
15:06:33.3 **HOT-1**	okay when you hit that you want that thing to be less than a thousand.		
15:06:36.7 **HOT-2**	roger.		
15:06:37.4 **HOT-1**	you want your V-S-I to be less than a thousand.		
		15:06:37.9 **APP-PHL**	november four five two delta alpha proceed direct MAZIE.
		15:06:41.5 **RDO-1**	direct MAZIE four five two delta alpha.
15:06:43.2 **HOT-1**	don't. don't lose altitude.		
15:06:51.3 **HOT-1**	zero three six on the heading.		
15:06:53.0 **HOT-2**	zero three six.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:06:55.1 **HOT-1**	watch the altitude.		
15:06:56.4 **HOT-2**	turn it. thank you.		
15:06:57.3 **HOT-1**	there ya go. I'll give you nav select nav mode when (we're) ready.		
15:07:01.3 **HOT-2**	yup.		
15:07:03.9 **HOT-1**	and four thousand altitude is selected. good. watch the airspeed. don't get above two fifty.		
15:07:11.5 **HOT-1**	you can hit A-C if you want. get some A-C goin' on in here.		
15:07:13.6 **HOT-2**	it's already in there.		
15:07:14.7 **HOT-1**	yeah did we takeoff with A-C?		
15:07:16.7 **HOT-2**	no.		
15:07:17.1 **HOT-1**	ah 'kay.		
15:07:19.9 **HOT-1**	air conditioning I know it's hot so.		
15:07:27.5 **HOT-1**	speed.		
15:07:28.6 **CAM**	[sound similar to decrease in engine thrust]		
15:07:28.8 **HOT-2**	pullin' back.		
15:07:32.8 **HOT-1**	much # better.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:07:36.8 **HOT-2**	I thought you were gonna say why are you # up?		
15:07:38.8 **HOT-1**	no. no. much # better.		
15:07:41.5 **HOT-1**	you've been paying attention to what I've been doin'. you're # understanding the #.		
15:07:45.6 **HOT-1**	you know what to # look for now.		
15:07:46.7 **CAM**	[sound similar to decrease in engine thrust]		
15:07:49.4 **HOT-1**	see how # ya # (it) and # incredible man. you're # doin' good right now.		
15:07:55.3 **CAM**	[sound similar to decrease in engine thrust]		
15:07:56.7 **HOT-1**	(at) least I've got the # radio so...		
15:07:58.9 **HOT-2**	yup.		
15:07:58.9 **HOT-1**	...that. that—		
15:08:00.3 **HOT-1**	mean you can see how I'm # handle the radios.		
15:08:03.2 **HOT-1**	while you're # flying.		
15:08:04.7 **HOT-2**	yes sir.		
		15:08:05.5 **APP-PHL**	november four five two delta alpha you have traffic at your one o'clock and about four miles is a Grumman V-F-R three thousand five hundred west bound.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:08:12.4 **RDO-1**	yeah lookin' for that traffic two delta alpha.
		15:08:14.3 **APP-PHL**	november one one niner six golf, you have traffic at your ten o'clock four miles eastbound it's a Learjet four thousand
15:08:17.1 **HOT-1**	Grumman.		
15:08:20.6 **HOT-1**	and if they give us # higher.		
		15:08:20.6 **AC-N1196G**	okay. ***.
15:08:22.7 **HOT-2**	we wouldn't have to worry about it.		
15:08:24.1 **HOT-1**	yeaaah.		
15:08:26.1 **HOT-1**	he's thirty-five. I don't even # see him on the-the traffic here.		
15:08:30.8 **HOT-1**	traffic is failed.		
15:08:33.1 **HOT-1**	don't ask me why # traffic is failed.		
15:08:33.2 **CAM**	[sound similar to increase in engine thrust]		
15:08:37.7 **CAM**	[sound similar to increase in engine thrust]		
15:08:39.8 **HOT-1**	two fifty on the speed. four thousand and we're direct MAZIE.		
15:08:42.1 **CAM**	[sound similar to increase in engine thrust]		
15:08:42.4 **HOT-2**	yup.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:08:43.7 **HOT-1**	nav mode select. so-so far # good. no issues what so # ever.		
15:08:49.1 **HOT-2**	seventy-five should do it. right now that's good right there. seventy-three. seventy-four.		
15:08:52.7 **HOT-1**	yeah that'll do it.		
15:08:54.7 **HOT-2**	keep us below two fifty.		
15:08:56.5 **HOT-1**	yup. uhhh.		
15:08:58.9 **HOT-2**	a Grumman at what? one o'clock? two o'clock?		
15:09:00.8 **HOT-1**	well he's # below us and ah not a factor I'm guess'n. I don't # see 'em.		
		15:09:04.9 **APP-PHL**	november four five two delta alpha turn left heading three six zero (it's) a vector for sequence I'll have you back direct MAZIE in a few more moments.
15:09:10.4 **HOT-2**	three six zero.		
		15:09:11.3 **RDO-1**	okay three six zero on the heading for two five brav— errr two delta alpha I'm (sorry).
15:09:17.0 **HOT-1**	heading select.		
15:09:18.9 **HOT-1**	there we go.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:09:22.6 **HOT-1**	someone's come'n behind us that the what they # wanna do. there's no one in front of us they want someone to climb over the top of us so they give us # uh forty-five degree bank to # MAZIE.		
15:09:30.7 **HOT-2**	# those guys.		
15:09:31.9 **HOT-1**	yeaaah. what the # man. we're a # Learjet. get us # higher.		
15:09:34.5 **HOT-2**	we could go faster.		
		15:09:35.7 **APP-PHL**	november four five two delta alpha. what's your airspeed?
15:09:37.5 **CAM**	[sound similar to decrease in engine thrust]		
		15:09:38.3 **RDO-1**	(now) we're showin' right now at twwwo siiiixty. four five two delta alpha.
15:09:44.5 **HOT-2**	(slowin') down.		
15:09:45.5 **HOT-1**	yes sir. # just admitted I violated # airspace but we're far enough away.		
15:09:49.3 **HOT-2**	that's why I was like ahhhhhhh.		
15:09:53.8 **HOT-2**	come on baby slow down for me.		
15:10:00.4 **HOT-2**	there we go.		
15:10:03.7 **HOT-1**	(eh) its within ten.		
15:10:05.8 **HOT-1**	I don't think (shh) we'll be violated for that.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:10:18.5 **HOT-1**	that's good. just right there. it'll bleed off a little.		
15:10:24.6 **HOT-1**	okay. where the # man? who why the # are they jackin' us on this? let us get the # up and get home.		
15:10:31.0 **HOT-2**	that's why. they don't want us to go home.		
15:10:33.4 **HOT-1**	#. give it a little power [sound similar to sigh].		
15:10:36.9 **HOT-1**	keep it within ten.		
15:10:39.4 **CAM**	[sound similar to increase in engine thrust]		
15:10:48.2 **CAM**	[sound similar to increase in engine thrust]		
		15:10:53.0 **AC-789HA**	seven eight nine hotel alpha check'n on four thousand tango.
15:10:56.8 **HOT-1**	that's who (ya is).		
15:11:19.8 **HOT-1**	come on man. what the #. over.		
		15:11:23.0 **APP-PHL**	november four five two delta alpha turn right direct uh MAZIE.
		15:11:27.0 **RDO-1**	'kay right turn direct MAZIE. four five two delta alpha.
15:11:30.0 **HOT-2**	number six.		
15:11:32.0 **HOT-2**	enter.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:11:33.3 **HOT-2**	aaand one zero nine please.		
15:11:33.7 **HOT-1**	one zero nine.		
15:11:39.6 **HOT-1**	and nav mode select when able.		
15:11:40.9 **HOT-2**	yup.		
15:11:42.6 **HOT-1**	there ya go.		
15:11:45.7 **HOT-1**	airspeed's good. # everything's # good.		
15:11:45.8 **HOT-2**	one zero nine.		
15:11:49.3 **HOT-1**	# MAZIE. it's gonna be-# behind us by the time we # get lined up for it.		
15:11:53.9 **HOT-2**	yup.		
15:12:03.3 **HOT-2**	# balls.		
		15:12:04.7 **RDO-1**	yeah four five two delta alpha any chance we can get higher?
		15:12:07.6 **APP-PHL**	four five two delta alpha. unable higher. I would have to ah spin you back around and sequence you with the rest of the traffic goin' into Teterboro.
		15:12:14.5 **RDO-1**	four five two delta alpha.
15:12:17.0 **HOT-2**	ha [exclaimed].		
15:12:19.9 **HOT-2**	it's like she doesn't like us.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:12:21.7 **HOT-1**	whatever. it's four # miles. it's right here somewhere.		
15:12:25.7 **HOT-1**	we're never gonna # get there. we're gonna fly right # over it before we # get there.		
15:12:32.0 **HOT-2**	it's holdin' the speed.		
15:12:32.8 **HOT-1**	now it's a # tail wind so yeah you have to pull back the power juuust a little.		
15:12:35.5 **HOT-2**	yup.		
15:12:36.1 **CAM**	[sound similar to decrease in engine noise]		
15:12:37.0 **HOT-2**	I've been listenin' to what you say.		
15:12:39.0 **HOT-1**	yeaaap.		
15:12:41.6 **HOT-2**	I've been keepin' it. and watching.		
15:12:47.3 **HOT-1**	two miles. right over # MAZIE.		
15:12:50.1 **HOT-1**	gonna be a left turn heading offfff zero five nine.		
15:12:54.1 **HOT-2**	yup.		
15:12:55.0 **HOT-2**	zero five nine.		
15:12:55.5 **HOT-1**	zero five nine.		
15:13:00.1 **HOT-2**	set right.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:13:01.9 **HOT-1**	zero five nine. set left.		
15:13:06.4 **HOT-1**	goin' to # BIGGY. #. how the #—		
15:13:10.2 **HOT-1**	yeah (now) don't # put us at # at four thousand all the # way. what the #? [high pitch, exclaiming].		
15:13:14.1 **HOT-2**	(and) zig zagging.		
15:13:16.7 **HOT-1**	yeah. she's gonna # carry it we-we won't # make it if we got (a) four thousand. she's a # idiot. get us someone else if she can't do it [high pitch, exclaiming].		
15:13:27.1 **HOT-1**	I # filed for #...		
15:13:30.0 **HOT-1**	...what is it? for twenty-seven man.		
		15:13:31.8 **APP-PHL**	november four five two delta alpha contact New York approach on one three two point eight good day.
		15:13:37.4 **RDO-1**	one three two point eight four five two delta alpha so long.
		15:13:40.7 **APP-NYC**	[prior cut off, similar to frequency change] —two niner seven five expect vectors I-L-S six circle runway one.
15:13:41.4 **HOT-2**	uhhh.		
		15:13:46.1 **AC-RRBZ**	two niner seven five. uh expect vectors I-L-S six. circle runway zero one. romeo bravo zulu.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:13:53.1 **RDO-1**	and New York center Learjet four five two delta alpha's checkin' in four thousand uh direct BIGGY at this time.
		15:13:58.2 **APP-NYC**	Lear four five two delta alpha New York approach Newark altimeter two niner seven five. fly heading zero two zero vector I-L-S six circle one.
15:14:06.4 **HOT-1**	okay what was the heading—		
		15:14:08.5 **RDO-1**	okay we got a two niner niner er uhh excuse me. what was that again. say again altimeter for two delta alpha.
15:14:10.9 **HOT-2**	two nine seven five.		
		15:14:12.8 **APP-NYC**	the altimeter's two niner seven five at Newark. Lear two delta alpha fly heading zero two zero vector I-L-S six circle one.
15:14:14.8 **CAM**	[sound of high pitch tone, similar to altitude alerter]		
		15:14:20.0 **RDO-1**	'kay zero two zero. four five two delta alpha.
		15:14:23.1 **APP-NYC**	papa romeo romeo bravo zulu descend and maintain five thousand.
15:14:24.3 **HOT-2**	zero two zero on the heading.		
		15:14:26.5 **AC-RRBZ**	five thousand. romeo bravo zulu.
15:14:26.7 **HOT-1**	what the # are they doing man? circling six?		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:14:28.1 **HOT-2**	uh zig zagging man.		
		15:14:29.8 **APP-NYC**	Jetlink mike foxtrot nine five kilo New York.
15:14:29.8 **HOT-2**	heading zero two zero.		
15:14:32.1 **HOT-1**	well we got the power pulled all the way # back you know so it's—		
15:14:36.8 **HOT-1**	no # point in—		
15:14:39.3 **HOT-2**	zero two zero.		
15:14:40.6 **HOT-1**	yeah. we're set.		
15:14:41.6 **HOT-2**	alright.		
15:14:42.0 **HOT-1**	zero two zero on the left.		
15:14:43.1 **HOT-2**	yup.		
15:14:44.1 **HOT-2**	#. alright.		
15:14:45.7 **HOT-2**	(set on the) right.		
15:14:47.4 **HOT-1**	he was saying circling # six or something. I don't know what the # they thinkin' we're doin'. we're # hundreds of miles away man.		
15:14:51.9 **HOT-2**	[sound similar to heavy breathing]		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:14:54.5 **APP-NYC**	(Jetlink) nine five (kilo) if you read New York ident.
15:14:58.9 **HOT-2**	what the # over?		
15:15:01.0 **HOT-2**	dude we're gonna get there like # an hour and you're gonna look at me and you're gonna say why is the time like this?		
		15:15:03.7 **APP-NYC**	roger papa romeo romeo bravo zulu turn right zero niner zero descend and maintain three thousand.
15:15:08.3 **HOT-1**	be there in twenty # minutes.		
		15:15:09.4 **AC-RRBZ**	right heading zero niner zero descend three thousand. romeo bravo zulu.
15:15:12.5 **HOT-1**	no act—		
15:15:12.5 **HOT-2**	no we're doin' S turns on this #.		
15:15:13.5 **HOT-1**	actually—		
		15:15:13.6 **APP-NYC**	Lear two delta alpha descend and maintain three thousand.
		15:15:16.2 **RDO-1**	three thousand. two delta alpha.
15:15:18.6 **HOT-1**	# eh man.		
15:15:20.5 **HOT-1**	let's go down to three.		
15:15:21.5 **HOT-2**	yup. doin' it.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:15:22.3 **HOT-1**	we're # gonna be there in ten minutes.		
15:15:25.0 **HOT-1**	I gotta' get the # ATIS. #. I didn't realize we're that # close.		
15:15:30.4 **HOT-1**	of course I don't have # uh G-P-S that's why.		
15:15:32.9 **HOT-2**	you wanna use my ipad?		
15:15:34.1 **HOT-1**	naw that's okay. (we'll/will) #—		
15:15:36.5 **HOT-1**	Teterboro—		
15:15:38.1 **HOT-1**	thirty-two eighty five.		
15:15:42.2 **CAM**	[sound of multiple clicks]		
15:15:44.1 **HOT-1**	I'm goin' off of one.		
15:15:45.1 **HOT-2**	yes sir.		
		15:15:46.9 **ATIS-TEB**	departure. ** (fly the procedure as published). all pilots follow noise abatement procedures. read back hold short instructions ** — [static throughout transmission]
		15:15:56.4 **APP-NYC**	Lear(jet) two delta alpha turn right heading one two zero.
		15:15:59.1 **RDO-2**	one two zero. four five two delta alpha.
15:16:02.6 **HOT-1**	what the #? one two zero? [high pitch, loudly]		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:16:04.4 **HOT-2**	yes sir.		
15:16:05.2 **HOT-2**	turn right to one two zero sir.		
15:16:05.2 **HOT-1**	holy #.		
15:16:07.6 **HOT-1**	yes sir. one two zero.		
		15:16:12.8 **ATIS-TEB**	[static] visibility [static].
15:16:14.0 **CAM**	[sound similar to decrease in engine thrust]		
		15:16:16.0 **ATIS-TEB**	light rain. five thousand five hundred scattered. temperature one eight. dew point six. altimeter two niner seven four [static throughout transmission].
15:16:25.4 **HOT-1**	two nine seven four.		
		15:16:26.9 **ATIS-TEB**	* approach in use ***. V-F-R departures contact clearance delivery on one two eight point zero five prior to taxi. bird activity in the vicinity of Teterboro airport. *** — [static throughout transmission]
15:16:31.8 **HOT-2**	hey it's uh at least it's good practice.		
15:16:41.0 **HOT-1**	watch the altitude.		
15:16:42.1 **HOT-2**	yup I'm on it.		
15:16:42.9 **HOT-1**	shallow it out.		
15:16:44.0 **HOT-2**	I already did.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:16:44.8 **ATIS-TEB**	(departure.) comply with altitude restrictions as published— [static throughout transmission]
		15:16:48.8 **APP-NYC**	papa romeo romeo bravo zulu turn right one one zero. vector for your descent.
		15:16:54.0 **AC-RRBZ**	right heading one one zero. vector for descent romeo bravo zulu.
		15:16:54.2 **ATIS-TEB**	advise on initial contact you have information zulu [static throughout transmission].
15:16:58.6 **HOT-1**	zulu.		
15:16:59.5 **CAM**	[sound similar to papers rustling]		
15:17:00.9 **HOT-1**	information zulu. who the # knows what's going on (in) Teterboro.		
		15:17:02.8 **APP-NYC**	(seven mike foxtrot) nine (mike) kilo New York.
15:17:05.3 **HOT-1**	don't have time to listen to it.		
15:17:08.2 **HOT-1**	I just got the altimeter.		
		15:17:09.1 **APP-NYC**	* nine five kilo
15:17:10.1 **HOT-2**	no worries.		
15:17:11.2 **HOT-1**	it's zulu two nine seven four.		
15:17:14.1 **CAM**	[sound similar to either papers rustling or seat moving on seat track]		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:17:14.9 **HOT-2**	roger.		
15:17:15.5 **HOT-1**	I guess we're #— do you see New York out there anywhere?		
15:17:18.0 **HOT-2**	negative. we're so # far from it. like—		
15:17:19.8 **HOT-1**	yeah.		
		15:17:20.3 **APP-NYC**	romeo romeo bravo zulu. turn left zero eight zero intercept the six localizer.
15:17:22.1 **HOT-2**	we're (in) the boonies.		
		15:17:25.4 **AC-RRBZ**	zero eight zero ** the localizer runway six ** bravo **.
15:17:25.4 **HOT-1**	well it's less than fifty miles man. that's why. two five zero on the speed sir.		
15:17:26.7 **CAM**	[sound similar to increase in engine thrust]		
15:17:29.9 **HOT-2**	yup.		
15:17:30.7 **HOT-1**	that's why. we're less than fifty miles away. #.		
15:17:33.8 **HOT-1**	no wonder they're s— got us so # low.		
15:17:38.0 **HOT-1**	but they got us at # three thousand. really? [high pitch, loudly]. what the # over? [high pitch, loudly] and we're goin' # south we're not goin' # north [high pitch, loudly].		
15:17:49.1 **HOT-1**	I don't know what. (well it) must be a flow issue.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:17:49.3 **HOT-2**	** al-al-altitude is good. three thousand's good. speed is good.		
15:17:55.5 **HOT-1**	yeah. there we go man. let's get some V-speeds (on the way).		
		15:17:55.8 **APP-NYC**	papa romeo romeo bravo zulu. contact New York approach on one two seven point six.
15:17:59.6 **HOT-1**	let's do the checklist.		
		15:18:01.5 **AC-RRBZ**	one two seven six. romeo bravo zulu so long.
15:18:05.0 **HOT-1**	so we got five. ten. fifteen. twenty. I'm gonna say one twenty-two.		
		15:18:06.7 **AC-UNK**	*** five thousand for seven thousand direct REGLE we have zulu at Teterboro.
15:18:10.9 **HOT-1**	now (you) got thirteen. fourteen. let's go uh. one twenty-six one nineteen.		
		15:18:12.4 **APP-NYC**	* zero *. *** wind gusts * two niner seven five. expect vectors I-L-S six circle one.
15:18:16.0 **HOT-2**	one twenty-six to one nineteen. roger.		
15:18:18.6 **HOT-1**	so just make it one twenty-six (man).		
		15:18:19.9 **AC-N900QC**	two nine seven five. uh I-L-S runway six circle to runway one. zero quebec charlie.
15:18:24.6 **HOT-1**	approach is one twenty-six. V-ref is one-nineteen.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:18:31.3 **CAM**	[sound similar to decrease in engine thrust]		
15:18:31.3 **HOT-2**	speed. I gotta' slow down a lot.		
15:18:33.6 **HOT-1**	yeah. we're only you know three thousand. #. two fifty's our top speed.		
15:18:40.5 **HOT-1**	# red sled man. and they got it— havin' us doing # S-turns into Teterboro. what the #. over?		
15:18:48.6 **HOT-2**	do some (airframes) have like a speed-dometer like you like can hold the speed?		
15:18:53.2 **HOT-1**	yeah. we do.		
15:18:54.3 **HOT-2**	oh.		
15:18:55.8 **HOT-1**	well—		
15:18:56.1 **HOT-2**	oh right there.		
		15:18:56.9 **AC-UNK**	uhh New York uhh * * *.
15:18:58.0 **HOT-1**	yeah. speed. but what it'll do to maintain that— it'll pitch up or down to maintain two fifty.		
		15:19:02.0 **APP-NYC**	* * alpha. New York approach * one niner zero. descend and maintain four thousand. newark altimeter two niner seven five.
15:19:04.9 **HOT-2**	I gotch'ya.		
15:19:06.6 **HOT-1**	because we—		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:19:08.8 **AC-95K**	one niner zero down to four thousand. two niner seven five for (compassion flight) niner five kilo.
15:19:08.9 **HOT-1**	we don't have auto throttles.		
15:19:11.2 **HOT-2**	I gotchy'a.		
		15:19:17.1 **APP-NYC**	Lear two delta alpha fly heading zero niner zero intercept the six localizer contact New York approach one two seven point six.
15:19:20.9 **CAM**	[sound similar to increase in engine thrust]		
		15:19:25.0 **RDO-1**	okay one two seven point six. fly heading zero nine zero to intercept the six into Teterboro. four five two delta alpha.
		15:19:31.6 **APP-NYC**	Falcon zero quebec charlie descend and maintain three— [cut off by frequency change]
15:19:37.0 **HOT-1**	# runway six I-L-S.		
15:19:38.0 **CAM**	[sound similar to increase in engine thrust]		
15:19:40.5 **HOT-1**	set this up on your side. one oh nine point nine.		
15:19:45.1 **HOT-1**	or excuse me. one oh eight point nine.		
15:19:47.1 **HOT-1**	zero six zero on the— localizer.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:19:49.8 **RDO-1**	New York Learjet four five two delta alpha. three thousand. zero nine zero on the heading for the I-L-S six into Teterboro.
15:19:55.2 **HOT-1**	zero six zero. [spoken in a whisper]		
		15:19:55.8 **APP-NYC**	Learjet four five two delta alpha New York approach roger.
15:20:00.2 **HOT-1**	one oh eight point nine and zero six zero.		
		15:20:01.2 **APP-NYC**	(Gotham) eight three two about eight miles from DANDY. (two thousand) * localizer. cleared I-L-S runway six approach circle runway one. traffic no factor.
15:20:09.1 **CAM**	[sound similar to increase in engine thrust]		
		15:20:09.1 **AC-GOTH832**	two thousand ** localizer *** Gotham ***.
15:20:09.7 **HOT-1**	'kay we're radar vectors so I'm gonna go ahead and set my # up for it as well.		
15:20:13.2 **HOT-2**	roger.		
15:20:16.5 **HOT-1**	you're on heading mode (nav) select one oh eight point nine.		
		15:20:19.1 **AC-N10MB**	Lear one zero mike bravo. eight thousand descending six thousand zulu at Teterboro.
15:20:19.2 **HOT-2**	yes sir.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:20:23.5 **APP-NYC**	Learjet one zero mike bravo New York approach. Newark altimeter's two niner seven five.
15:20:23.7 **CAM**	[sound similar to increase in engine thrust]		
		15:20:28.4 **AC-N10MB**	nine(r) seven five.
15:20:29.5 **HOT-2**	runway in sight.		
15:20:31.2 **HOT-1**	for six?		
		15:20:32.0 **APP-NYC**	Learjet two delta alpha make sure you intercept the localizer.
15:20:32.0 **HOT-2**	right there.		
		15:20:34.8 **RDO-1**	four five two delta alpha copy.
15:20:36.8 **HOT-1**	what the # over?		
15:20:38.0 **HOT-1**	zero six zero why aren't you not—		
15:20:40.0 **HOT-1**	intercepting it. I guess it's # left.		
15:20:42.0 **HOT-1**	we're makin' the left.		
		15:20:42.6 **APP-NYC**	Learjet two delta alpha left turn twenty heading (if) you (need it) to join.
15:20:42.9 **HOT-2**	yup.		
		15:20:45.7 **RDO-1**	we got it four five two delta alpha.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:20:47.3 **APP-NYC**	papa romeo romeo bravo zulu descend and maintain (two) thousand.
15:20:49.7 **HOT-2**	you want me to hit nav?		
		15:20:50.9 **AC-RRBZ**	** romeo bravo zulu.
15:20:51.1 **HOT-1**	#. that's why.		
15:20:57.0 **HOT-1**	there we go. #—		
15:21:00.1 **HOT-1**	# runway's out there somewhere. I don't know why you're lookin' over there.		
		15:21:00.2 **APP-NYC**	Gotham eight three two *** five.
15:21:01.7 **HOT-2**	yeah that was Newark. that was Newark.		
15:21:04.8 **HOT-2**	I thought that was Teterboro.		
		15:21:04.8 **AC-UNK**	*** Teterboro nineteen five *** . copy (and you too).
15:21:09.0 **HOT-1**	alright your localizer is captured.		
15:21:11.5 **HOT-1**	and we've got nav mode selected on the F-M-S.		
		15:21:13.4 **APP-NYC**	Learjet one zero mike bravo (depart metro) heading * * *.
15:21:15.4 **HOT-1**	go ahead and slowwwwly bring it on back on the power not not crazy though 'cause we still got a ways to go.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:21:20.8 **HOT-2**	I'll put it at like one eighty.		
15:21:22.4 **HOT-2**	what do ya think?		
15:21:22.6 **HOT-1**	not. no. no.		
		15:21:23.1 **AC-N10MB**	what's uh give me again uh * again the phonetic.
15:21:24.0 **HOT-1**	keep it about two forty.		
15:21:25.4 **HOT-2**	okay.		
15:21:26.8 **HOT-1**	we're not far enough.		
		15:21:27.2 **APP-NYC**	Learjet one zero mike bravo. MUGZYs come'n up at a mile. ummm ***.
15:21:30.0 **HOT-1**	I'm showing twenty nine miles to go to Teterboro. so we got a # ways to go.		
		15:21:33.4 **AC-N10MB**	*** one zero mike bravo.
15:21:37.8 **HOT-1**	we're so # far out he wants us to #—		
15:21:38.6 **CAM**	[sound similar to decrease in engine thrust]		
		15:21:40.0 **AC-GOTH72**	New York Gotham seven two from seven to six thousand with zulu.
15:21:40.2 **HOT-1**	#—		
15:21:42.9 **HOT-1**	you got two forty on your speed. two four zero.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:21:43.2 **APP-NYC**	* New York approach. altimeter's two niner seven five.
15:21:44.9 **CAM**	[sound similar to decrease in engine thrust]		
15:21:45.4 **HOT-2**	roger.		
		15:21:47.1 **AC-GOTH72**	Gotham seven two.
15:21:50.0 **HOT-1**	yeah that's all # up.		
15:21:51.7 **HOT-1**	let me get the—		
		15:21:52.6 **APP-NYC**	Learjet two delta alpha. uhhh just go— can you go to VINGS? can you do that? VINGS? and then just localizer six?
		15:21:58.1 **RDO-1**	four five two delta alpha copy.
		15:22:00.7 **AC-RRBZ**	New York. papa romeo romeo bravo zulu.
		15:22:03.7 **APP-NYC**	go ahead.
		15:22:04.9 **AC-RRBZ**	can I (talk) for (checking) our speed please?
15:22:05.2 **HOT-1**	#.		
		15:22:06.9 **APP-NYC**	papa romeo romeo bravo zulu you're about five miles from VINGS. cross VINGS at two thousand feet. cleared I-L-S runway six. circle one. maintain two five zero knots until VINGS and then after that you can maintain one eight zero knots or greater till TORBY.
15:22:08.7 **HOT-1**	V-I…		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:22:12.1 **HOT-1**	…N-G-S.		
		15:22:20.2 **AC-RRBZ**	okay VINGS at two thousand aaand then * circle *** after VINGS at least *** —
15:22:23.7 **HOT-1**	zero five five. zero five five in there.		
15:22:25.0 **HOT-2**	zero five five.		
15:22:26.8 **HOT-1**	gonna go in nav mode.		
15:22:29.0 **HOT-2**	go ahead and take over I'll uh— I'll uh—		
15:22:29.8 **HOT-1**	on the F-M-S * we're there we're going direct VINGS at this time. twelve miles away to VINGS.		
		15:22:32.4 **APP-NYC**	Learjet two one zero mike bravo descend and maintain four thousand.
15:22:36.8 **HOT-1**	you still got the localizer on your side so we're doin' good.		
		15:22:37.0 **AC-N10MB**	four thousand mike bravo.
15:22:39.7 **HOT-2**	alright.		
15:22:41.5 **HOT-2**	I don't wanna # up.		
15:22:41.6 **HOT-1**	(he's) got us twenty-six # miles out and he expects us to collect the #— uh be able to uh—		
		15:22:46.7 **APP-NYC**	Learjet four five two delta alpha descend and maintain two thousand.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:22:49.8 **RDO-1**	two thousand. four five two delta alpha.
15:22:51.7 **HOT-1**	down to two.		
15:22:52.4 **HOT-2**	roger.		
15:22:52.6 **HOT-1**	go ahead and pull it all the way to # idle.		
15:22:54.8 **CAM**	[sound similar to decrease in engine thrust]		
15:22:55.1 **HOT-1**	only a thousand feet per minute descent so it's not a big deal.		
15:22:56.0 **CAM**	[sound of high pitch tone, similar to altitude alerter]		
15:22:58.9 **HOT-1**	don't have to chase after it-it will come down on its own at a decent rate.		
15:23:04.1 **HOT-1**	try to keep the speed at about one er two forty.		
		15:23:08.8 **APP-NYC**	papa romeo romeo bravo zulu make sure you cross * at (two) thousand Teterboro tower nineteen five good day.
15:23:11.0 **CAM**	[sound similar to increase in engine thrust]		
15:23:11.4 **HOT-1**	let me help you out we're trimming it forward a little.		
		15:23:16.3 **AC-RRBZ**	okay. DANDY one thousand five hundred feet. aaand call Teterboro tower (roger).
15:23:19.7 **HOT-2**	should I trim more?		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:23:21.4 **HOT-1**	trimmin' yourself forward.		
15:23:22.9 **HOT-2**	yeah.		
15:23:23.4 **HOT-1**	that's okay.		
		15:23:23.7 **APP-NYC**	Learjet four five two delta alpha is eight miles from VINGS cross VINGS at two thousand feet, cleared I-L-S runway six. circle runway one.
		15:23:31.1 **RDO-1**	okay cleared I-L-S six circle one uh VINGS two thousand. four five two delta alpha.
15:23:35.3 **CAM**	[sound similar to increase in engine thrust]		
		15:23:35.9 **APP-NYC**	Learjet two delta alpha what's your current airspeed?
		15:23:38.4 **RDO-1**	eh we're showin' two forty.
		15:23:39.8 **RDO-1**	two delta alpha.
		15:23:40.5 **APP-NYC**	two four zero knots till VINGS and then uh you can slow to one eight zero knots maintain that till TORBY.
		15:23:45.3 **RDO-1**	alright. two forty until VINGS eh two thousand on the altitude and we can slow it down to one eighty to TORBY. four five two delta alpha.
		15:23:53.5 **AC-N900QC**	nine hundred quebec charlie is with you three thousand about to join the ah localizer.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:23:55.8 **CAM**	[sound similar to increase in engine thrust]		
		15:23:56.8 **APP-NYC**	Falcon 900 quebec charlie ** localizer two five zero knots.
15:23:58.4 **HOT-1**	localizer's come'n alive.		
15:24:01.0 **HOT-1**	you are nav mode selected. we're on F-M-S still		
		15:24:01.3 **AC-N900QC**	* fifty knots ** .
		15:24:03.1 **APP-NYC**	Gotham seventy two fly heading * * sequence descend and maintain * *
15:24:04.2 **HOT-1**	six miles to VINGS. maintain two forty till VINGS two thousand on the altitude. we're circling runway one.		
		15:24:08.4 **AC-GOTH72**	***.
15:24:11.1 **HOT-1**	so circling minimums.		
15:24:13.3 **HOT-1**	is seven hundred and sixty.		
15:24:15.6 **HOT-2**	oh #.		
15:24:16.6 **HOT-1**	yeah.		
15:24:18.3 **HOT-2**	alright I'm gonna go— you're gonna have—		
15:24:19.4 **HOT-1**	slow it on down to— well we're two forty— we're right— * *—		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:24:22.0 **HOT-2**	yeah. you come'n to two forty so—		
		15:24:23.1 **APP-NYC**	Learjet one zero mike bravo descend and maintain tree thousand.
15:24:24.5 **CAM**	[sound similar to decrease in engine thrust]		
		15:24:26.5 **AC-N10MB**	three thousand *** .
15:24:26.8 **HOT-1**	'kay when your localizer comes alive we're gonna # trout— did he clear us for the localizer?		
15:24:31.4 **HOT-2**	yeah.		
		15:24:31.4 **AC-FLEX562**	New York. Flexjet five six two with you level six thousand zulu.
15:24:32.3 **HOT-1**	yes he did.		
15:24:34.2 **HOT-1**	yeah I'm going heading mode select.		
		15:24:35.6 **APP-NYC**	Flexjet five forty two New York approach roger altimeter. Newark's altimeter two niner seven five. zulu current.
15:24:36.5 **HOT-1**	it's # bumpy.		
15:24:38.8 **HOT-1**	gonna dial myself up one oh eight nine.		
15:24:41.1 **HOT-1**	inbound course is zero five— zero six zero.		
		15:24:41.5 **AC-FLEX562**	two nine seven five. five (six) *.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:24:43.4 **HOT-2**	yeah. yes. zero six zero. I turned it by accident.		
		15:24:43.7 **APP-NYC**	Flexjet five forty two (reset your transponder) squawk tree tree seven zero.
15:24:47.1 **HOT-2**	there ya go.		
		15:24:48.2 **AC-FLEX562**	three three seven zero.
15:24:50.8 **HOT-1**	your localizer's coming alive so it should be come'n alive on my side.		
15:24:56.1 **HOT-1**	two forty 'til VINGS and then we can slow it down to one eighty all the way to TORBY which is the final approach fix.		
15:25:01.6 **CAM**	[sound similar to increase in engine thrust]		
15:25:03.9 **HOT-1**	VINGS is two miles away and counting.		
15:25:06.8 **HOT-2**	roger.		
15:25:08.2 **HOT-2**	you're gonna have to get on with it— with me when we uh start this #.		
15:25:10.8 **HOT-1**	hey we're tracking the V-O-R inbound now.		
15:25:13.1 **HOT-2**	there's the airport.		
15:25:13.9 **HOT-1**	yes sir. we're tracking— we're tracking the localizer excuse me.		
15:25:17.3 **HOT-1**	two forty on the speed sir.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:25:19.4 **HOT-2**	okay. reducing speed.		
15:25:20.7 **CAM**	[sound similar to decrease in engine thrust]		
15:25:23.7 **HOT-1**	and—		
15:25:25.4 **HOT-1**	VINGS.		
		15:25:26.6 **APP-NYC**	Hawker nine zero zero quebec charlie— you're about thirteen miles from VINGS. cross VINGS at two thousand (I-L-S) six circle to runway one.
15:25:29.8 **HOT-1**	'kay.		
15:25:31.9 **HOT-1**	go ahead and pull all the way to idle.		
15:25:34.2 **CAM**	[sound similar to decrease in engine thrust]		
		15:25:35.4 **AC-N900QC**	VINGS at two thousand. cleared uh for the I-L-S six circle to one. zero quebec charlie.
		15:25:39.7 **APP-NYC**	Hawker zero quebec charlie *** until VINGS * reduce speed to ***.
15:25:40.9 **HOT-1**	down to one eighty on the airspeed.		
15:25:43.1 **HOT-1**	no. no. no. no.		
15:25:44.4 **HOT-1**	don't # do that yet. we haven't captured the glideslope.		
		15:25:48.0 **AC-N900QC**	okay two hundred until VINGS we can reduce to one eight zero (november) nine * * quebec (charlie).

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:25:48.4 **HOT-1**	don't trim forward.		
15:25:50.8 **HOT-1**	'kay. one eighty.		
15:25:52.5 **HOT-1**	is the slowest.		
		15:25:53.3 **AC-EXEC302**	Execjet three zero two * * * hundred for three thousand.
15:25:54.6 **HOT-1**	one eighty will be our slope-ist.		
		15:25:57.4 **APP-NYC**	Execjet three oh two. roger New York approach. direct uh (KWITE)
		15:26:00.3 **AC-EXEC302**	direct (KWITE) for Execjet three zero two.
15:26:02.1 **HOT-1**	tower's nineteen five.		
		15:26:03.0 **AC-N999GC**	* for triple niner golf charlie six thousand four hundred for six thousand at MUGS uhhh MUGZY we have zulu.
		15:26:08.5 **APP-NYC**	november nine nine nine golf charlie New York approach Newark altimeter's two niner seven five and * zulu ***.
15:26:13.2 **HOT-2**	wow it's # bumpy as #.		
15:26:13.8 **HOT-1**	one— one eighty to one ninety. yeah. yoke.		
		15:26:15.7 **APP-NYC**	november niner golf charlie roger. depart MUGZY a heading one four zero vector sequence.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:26:17.3 **CAM**	[sound similar to engine igniters begin and continue until end of recording]		
15:26:20.2 **CAM**	[sound similar to increase in engine thrust]		
		15:26:21.0 **AC-N999GC**	depart MUGZY heading one four zero triple nine golf charlie.
15:26:21.1 **HOT-1**	before landing checks.		
		15:26:23.8 **APP-NYC**	Flexjet five forty two fly present heading * * * .
15:26:24.9 **HOT-2**	set.		
15:26:25.5 **HOT-1**	one eighty on the speed. one ninety on the speed. there ya go.		
15:26:26.8 **CAM**	[sound similar to gear warning horn briefly audible]		
15:26:27.5 **CAM**	[sound similar to increase in engine thrust]		
		15:26:28.5 **APP-NYC**	***.
15:26:28.6 **HOT-1**	I'll give you flaps at eight. uh. this will help you out.		
15:26:31.2 **HOT-2**	yup. flaps eight please.		
		15:26:32.1 **APP-NYC**	Learjet two delta alpha contact Teterboro tower one one niner point five. be sure (you) cross DANDY (fitch) hundred feet circle at TORBY.
15:26:37.0 **CAM**	[sound similar to increase in engine thrust]		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:26:38.9 **RDO-1**	alright DANDY at two hundred feet. circle at TORBY. nineteen five. four five two delta alpha.
		15:26:43.1 **APP-NYC**	uh DANDY at fifteen hundred feet two delta alpha.
		15:26:46.0 **RDO-1**	DANDY at fifteen. four five two delta alpha.
15:26:48.4 **HOT-1**	I'm not gettin' flap indicator.		
		15:26:48.4 **AC-UNK**	*** two sixty heading.
15:26:48.9 **CAM**	[sound similar to decrease in engine thrust]		
15:26:51.8 **HOT-1**	there we go.		
		15:26:52.8 **APP-NYC**	Gotham eight thirty two New York approach roger. and uh expect re-sequence the I-L-S six circle one. what happened uh **.
15:26:57.8 **HOT-1**	fifteen at DANDY.		
		15:26:59.3 **AC-GOTH832**	yeah just the winds weren't favorable at that time so ** another one.
15:26:59.4 **CAM**	[sound similar to decrease in engine thrust]		
15:27:01.5 **HOT-1**	mandatory at fifteen.		
		15:27:03.1 **APP-NYC**	roger.
15:27:07.4 **HOT-1**	you got any indication on uh distance for DANDY?		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:27:07.7 **CAM**	[sound similar to decrease in engine thrust]		
		15:27:10.1 **APP-NYC**	Execjet three oh two your * miles from (KWITE) cross ** R-nav G-P-S runway five.
15:27:10.8 **HOT-2**	nope I got nothing.		
15:27:12.0 **HOT-1**	six point four Teterboro.		
15:27:16.2 **HOT-1**	okay we're fine.		
		15:27:17.0 **AC-EXEC302**	alright * KWITE *** for the R-nav ** Execjet three zero two.
15:27:17.4 **HOT-2**	go ahead and descend?		
15:27:18.6 **HOT-1**	not yet.		
15:27:19.6 **HOT-1**	glideslope's come'n in you gotta' look at my side.		
15:27:22.7 **HOT-2**	roger.		
15:27:23.1 **HOT-1**	'kay. slow it on down.		
		15:27:23.2 **APP-NYC**	Gotham eight (thirty two) runway one I can ** get you in behind the (Learjet) * two thousand ***.
15:27:25.4 **HOT-1**	one eighty till DANDY. or Tobey [mispronunciation of TORBY].		
15:27:28.3 **HOT-1**	which is the final approach fix.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:27:28.7 **CAM**	[sound similar to decrease in engine thrust]		
		15:27:29.2 **AC-GOTH832**	yeah whatever's easiest for you for Gotham eight three two.
15:27:31.0 **HOT-1**	okay now we should—		
		15:27:31.1 **APP-NYC**	Gotham eight three two okay turn left heading one eight zero vectors for a visual approach runway one.
		15:27:35.2 **AC-GOTH832**	okay one eighty vectors visual ***.
15:27:36.3 **HOT-1**	it did not capture. trim the nose over.		
		15:27:37.6 **APP-NYC**	one zero mike bravo descend and maintain two thousand.
15:27:40.4 **HOT-1**	you're gonna have to fly on— you gotta' glideslope on your side?		
		15:27:40.5 **AC-N10MB**	two thousand zero mike bravo *** .
		15:27:42.6 **APP-NYC**	** charlie ***.
15:27:43.4 **HOT-2**	yes sir.		
15:27:44.1 **HOT-1**	follow your glideslope. do not go below fifteen [emphasized].		
		15:27:46.9 **APP-NYC**	Gotham seven two turn left heading one six zero descend and maintain tree thousand.
15:27:47.2 **HOT-2**	roger.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:27:50.9 **AC-GOTH72**	one six zero at three thousand. Gotham seven two.
15:27:52.0 **HOT-1**	(okay)		
		15:27:53.4 **APP-NYC**	Execjet three zero two. radar services terminated. contact Morristown tower (one) one eight point one.
15:27:54.6 **CAM**	[sound of increased background noise, similar to air drag on landing gear during extension]		
		15:27:58.1 **AC-EXEC302**	eighteen one for Execjet ***.
15:27:58.7 **HOT-1**	'kay. slow to one eighty.		
15:28:02.6 **CAM**	[sound similar to decrease in engine thrust]		
15:28:05.2 **HOT-1**	'cause I gotta' get ya flaps twenty.		
15:28:06.8 **HOT-1**	there ya go.		
		15:28:06.9 **APP-NYC**	Gotham eight thirty two turn left heading of one three (zero) * traffic twelve o'clock (Learjet) * circle to runway one.
15:28:08.9 **HOT-1**	flaps twenty. gear down. [emphasized]		
15:28:10.8 **HOT-1**	follow the # glideslope [emphasized]		
15:28:13.2 **HOT-2**	alright you said don't go below one—		
15:28:14.3 **HOT-1**	yeah don't go below fifteen 'til I call TORBY.		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:28:15.1 **AC-UNK**	***.
		15:28:17.4 **APP-NYC**	(delta) alpha contact Teterboro tower nineteen five.
		15:28:19.4 **RDO-1**	nineteen five. four five two delta alpha.
15:28:21.1 **HOT-1**	alright.		
		15:28:21.4 **APP-NYC**	Hawker zero quebec charlie (reduce to) one eight zero knots.
15:28:22.0 **HOT-1**	now you can bring it on down.		
15:28:23.8 **HOT-2**	roger.		
15:28:24.2 **HOT-1**	bring it on down.		
		15:28:25.1 **AC-N900QC**	'kay reducing. zero quebec charlie.
		15:28:26.7 **APP-NYC**	Learjet one zero mike bravo reduce speed to one eight zero
15:28:27.1 **HOT-1**	seven sixty. [emphasized]		
15:28:29.7 **HOT-2**	seven sixty roger.		
		15:28:30.4 **TWR-TEB**	november four five two delta alpha Teterboro tower.
		15:28:32.4 **RDO-1**	yeah we're up uh for the circling uhhh onnne two delta alpha.
15:28:33.1 **CAM**	[sound of high pitch tone, similar to altitude alerter]		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
		15:28:36.2 **TWR-TEB**	roger Lear four five two delta alpha. wind three six zero at one six gust three two. runway one continue traffic holding in position.
		15:28:42.2 **RDO-1**	four five two delta alpha.
15:28:43.9 **HOT-1**	kay do not go below your—		
		15:28:44.9 **TWR-TEB**	* winds—
15:28:45.4 **HOT-1**	eight hundred.		
		15:28:45.8 **TWR-TEB**	** zero one eight gusts to three two.
15:28:46.6 **HOT-2**	alright there's eight hundred.		
		15:28:47.3 **TWR-TEB**	** cleared for takeoff traffic * half miles final ***.
15:28:48.2 **HOT-1**	eight— eight hundred. right there. hold eight hundred.		
15:28:49.9 **HOT-2**	(yeah) I am.		
		15:28:50.3 **AC-UNK**	*** for (one thirty one).
15:28:51.5 **HOT-1**	watch your airspeed. hand on the # throttle.		
		15:28:51.6 **TWR-TEB**	** delta alpha *** parking.
		15:28:54.5 **RDO-1**	yeah we're gonna be at Jet Aviation. four five two delta alpha. cleared to land one.

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:28:58.2 **HOT-1**	'kay we're gonna circle for runway one.		
15:29:00.1 **HOT-2**	okay.		
15:29:00.7 **HOT-1**	so we're kinda on a downwind.		
15:29:03.7 **HOT-1**	so. go'head.		
15:29:04.3 **HOT-?**	[sound of unintelligible whisper]		
15:29:05.1 **HOT-1**	break off the autopilot.		
15:29:06.1 **CAM**	[sound similar to autopilot disconnect tone]		
15:29:06.8 **HOT-2**	there ya go.		
15:29:07.1 **HOT-1**	hand on the #—		
		15:29:07.3 **TWR-TEB**	(delta alpha) you gonna start that turn?
		15:29:09.2 **RDO-1**	yeah sir we're doin' it right now four (sixty) delta alpha.
15:29:12.1 **HOT-1**	right.		
15:29:12.6 **CAM**	[sound similar to decrease in drag noise]		
15:29:13.8 **HOT-1**	[sound similar to sigh]		
15:29:14.7 **HOT-1**	watch the airspeed.		
15:29:15.3 **HOT-2**	your flight controls. [emphasized]		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:29:16.7 **CAM**	[sound of faint mechanical whine]		
15:29:17.6 **CAM**	[sound of high pitch tone, similar to altitude alerter]		
15:29:18.0 **HOT-1**	there we go.		
15:29:18.8 **EGPWS**	five hundred.		
15:29:19.8 **HOT-1**	disregard.		
15:29:21.1 **HOT-2**	roger. [strained voice]		
15:29:21.6 **EGPWS**	sink rate. pull up.		
15:29:26.2 **HOT-2**	meeeh. [strained voice] I'm gonna give ya your controls okay?		
15:29:28.5 **HOT-1**	alright. my controls.		
15:29:29.2 **HOT-2**	your flight controls.		
15:29:30.3 **HOT-1**	# eh. [spoken in angry tone]		
15:29:31.5 **HOT-1**	watch my airspeed.		
15:29:32.7 **HOT-2**	yup.		
15:29:32.8 **CAM**	[sound similar to high frequency aerodynamic noise]		
15:29:33.6 **HOT-1**	[heavy breathing]		

TIME/ SOURCE	INTRA-COCKPIT CONTENT	TIME/ SOURCE	AIR-GROUND COMMUNICATION CONTENT
15:29:34.5 **HOT-2**	lookin' good.		
15:29:35.5 **HOT-2**	V-ref.		
		15:29:35.6 **TWR-TEB**	* contact departure one one niner point two.
15:29:35.6 **HOT-1**	no.		
15:29:38.1 **HOT-2**	add airspeed. [emphasized] airspeed. airspeed. airspeed. [exclaimed]		
15:29:40.6 **HOT-1**	stall. [strained voice]		
15:29:41.2 **HOT-2**	yup.		
15:29:41.6 **CAM**	[sound similar to high frequency aerodynamic noise]		
15:29:42.3 **HOT-1**	[sound of strained breathing]		
15:29:43.1 **HOT-2**	airspeed. airspeed. [exclaimed]		
15:29:43.2 **HOT-1**	#.		
15:29:43.7 **EGPWS**	sink rate. pull up.		
		15:29:43.9 **RDO-1**	ahhh # [yelled] [based on Teterboro Tower air traffic control recording, this utterance was transmitted over the radio]

END OF TRANSCRIPT
END OF RECORDING
15:29:44 EST