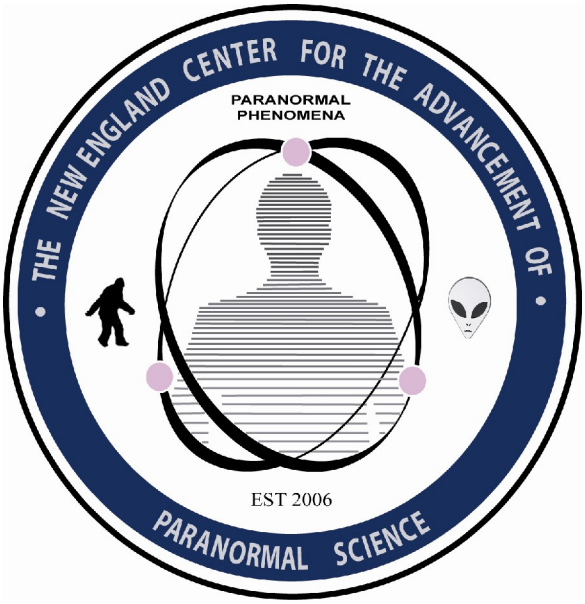


Electronic Voice Phenomena

Audio Spectrum & Phonetic Analysis Report

2010

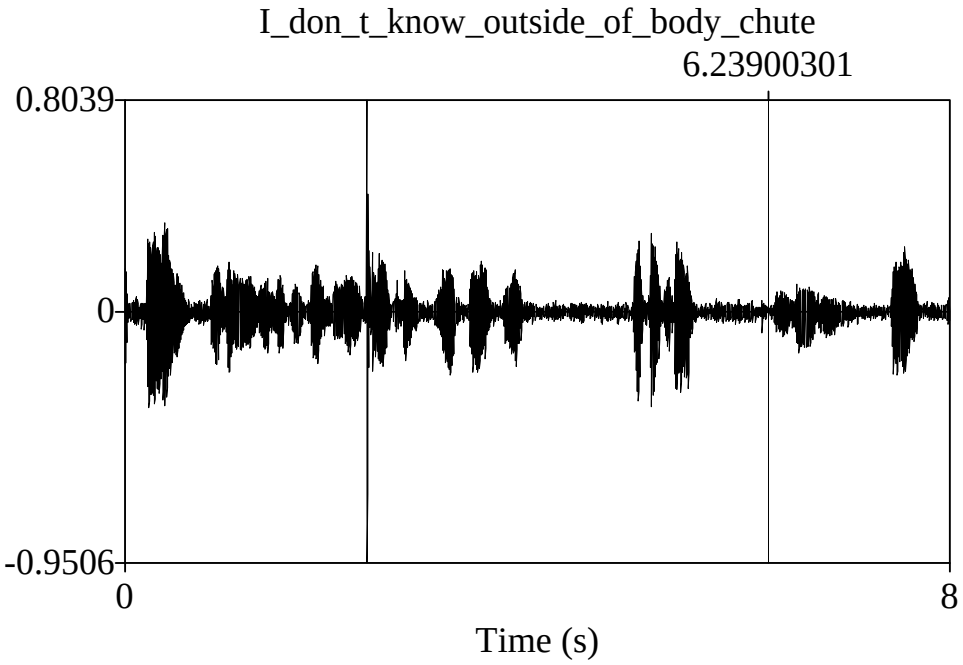
Document No. 07041001
File Name: I_Don't_Know_Near_Body_Chute.wav
Prepared for: Paranormal Researchers and Investigators of Maine
Date: July 4, 2010

Table of Contents:

Introduction

On July 1, 2010 Mandy Logsdon from Paranormal Researchers and Investigators of Maine submitted a file to N.E.C.A.P.S. for audio spectrum analysis.

According to Mandy, the file was acquired at the Waverly Hills Sanatorium in Lexington, Kentucky in an area of the hospital known as "The body chute". Upon reviewing the file, PRI-Maine discovered a section of their audio evidence contained an unexplainable voice sample of an unidentified male saying the alleged phrase "I don't know." Upon asking the rest of their team if anyone spoke the phrase they made the determination that the sample was from an unknown source. The sample was sent to N.E.C.A.P.S. for more detailed analysis.

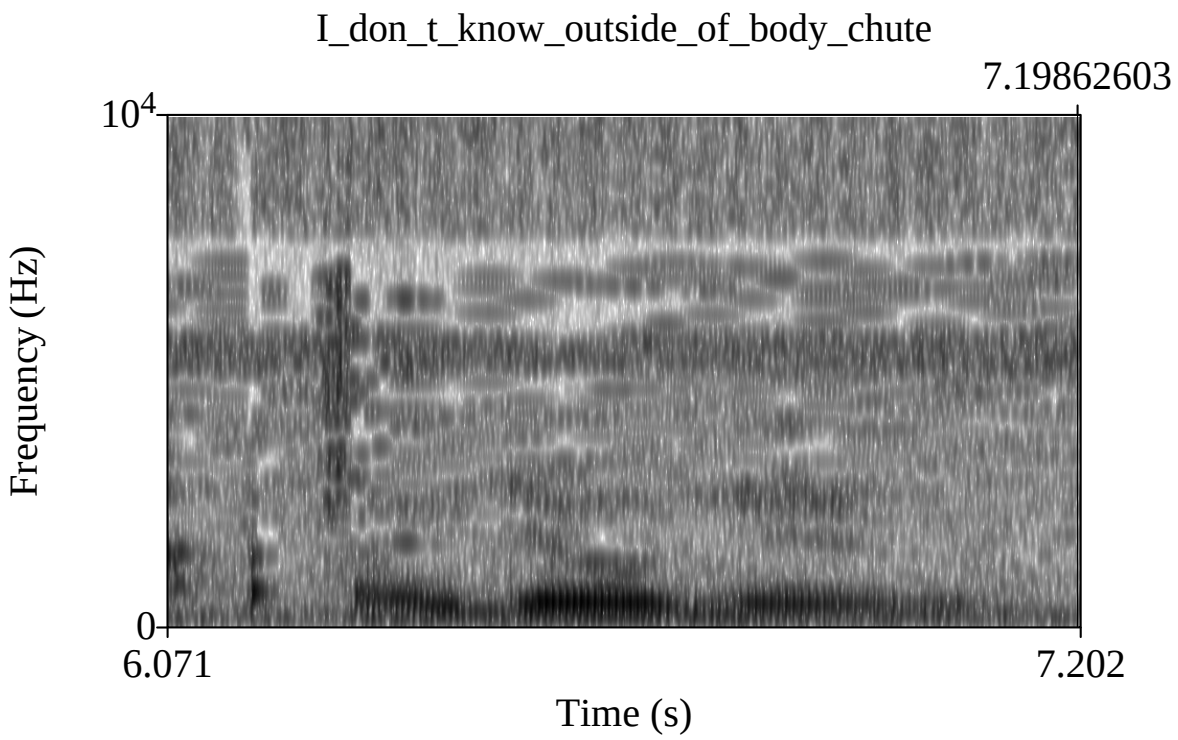


File Transcription:

Subject Female 1: *"We're doing an EVP session on floor 2354?"*
Subject Male 2: *"I think so... I…"*
Anomaly: "I don't know"
Subject Male 3: *"I don't…"*

Spectrum Analysis

Spectrogram:



I DON'T KNOW

What is a Spectrogram?

*A **spectrogram** is an image that shows how the spectral density of a signal varies with time. Also known as **spectral waterfalls**, **sonograms**, **voiceprints**, or **voice grams**, spectrograms are used to identify phonetic sounds, to analyze the cries of animals, and in the fields of music, sonar/radar, speech processing, seismology, etc. The instrument that generates a spectrogram is called a **spectrograph** or **sonograph**.*

Our Spectrogram Evaluation:

The spectrogram analysis of the subject file contains several notable attributes. First it is our belief that the original file was not tampered with and the complete frequency spectrum for the Olympus DSC1023 digital recorder is still represented in the sample given.

The sample does contain what appears to be a natural discrepancy in the background noise ranging from 6037Hz to 7638Hz. It appears there is a lower level of background noise intensity within this range with several anomalous background noise bursts which show up randomly in the rest of the file. This discrepancy seems to appear throughout the entire submitted file but only during areas of speech. It is my opinion that this can be attributed to the noise cancellation circuit built into the recorder (Perhaps a noise gate circuit).

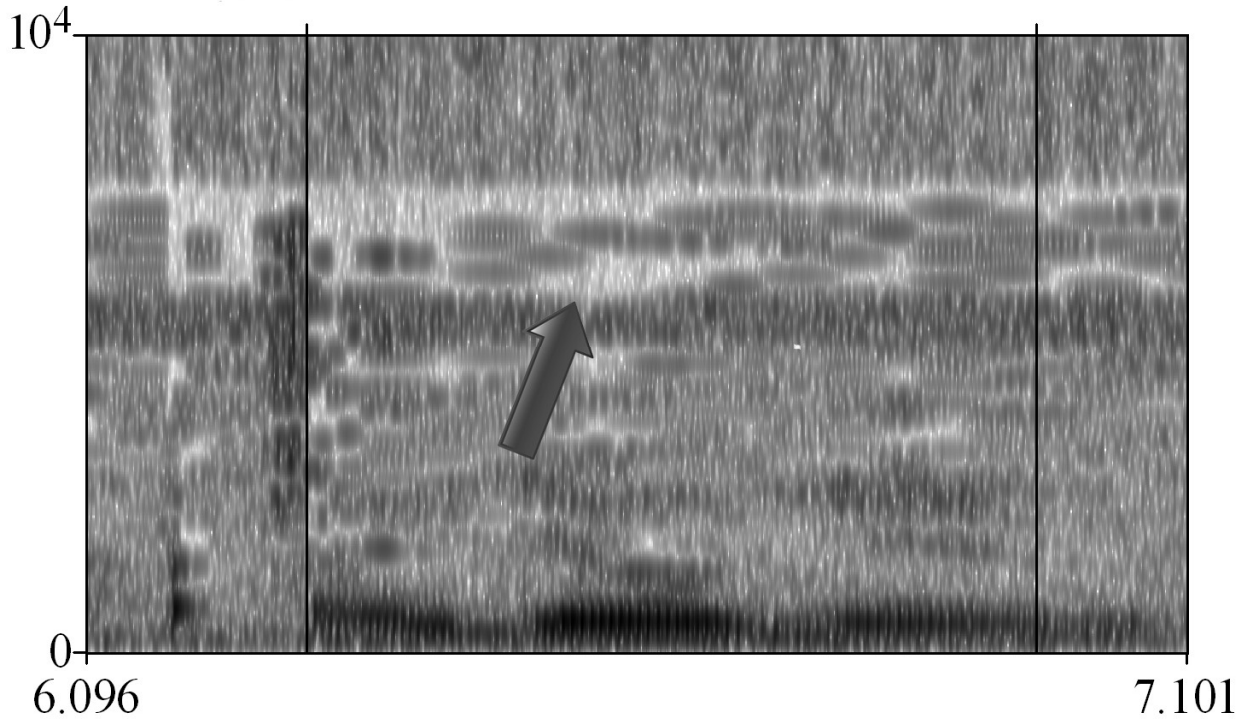


Figure above: Lighter band of gray shows area of decreased background noise.

Also, there is an unusual burst in background noise density ranging from 2117Hz to 7334Hz and lasting from 6.24 seconds to 6.30 seconds. Since the only time this anomaly appears is directly before the subject statement (“I don’t know”), we do not have enough data to make a determination of how this occurred.

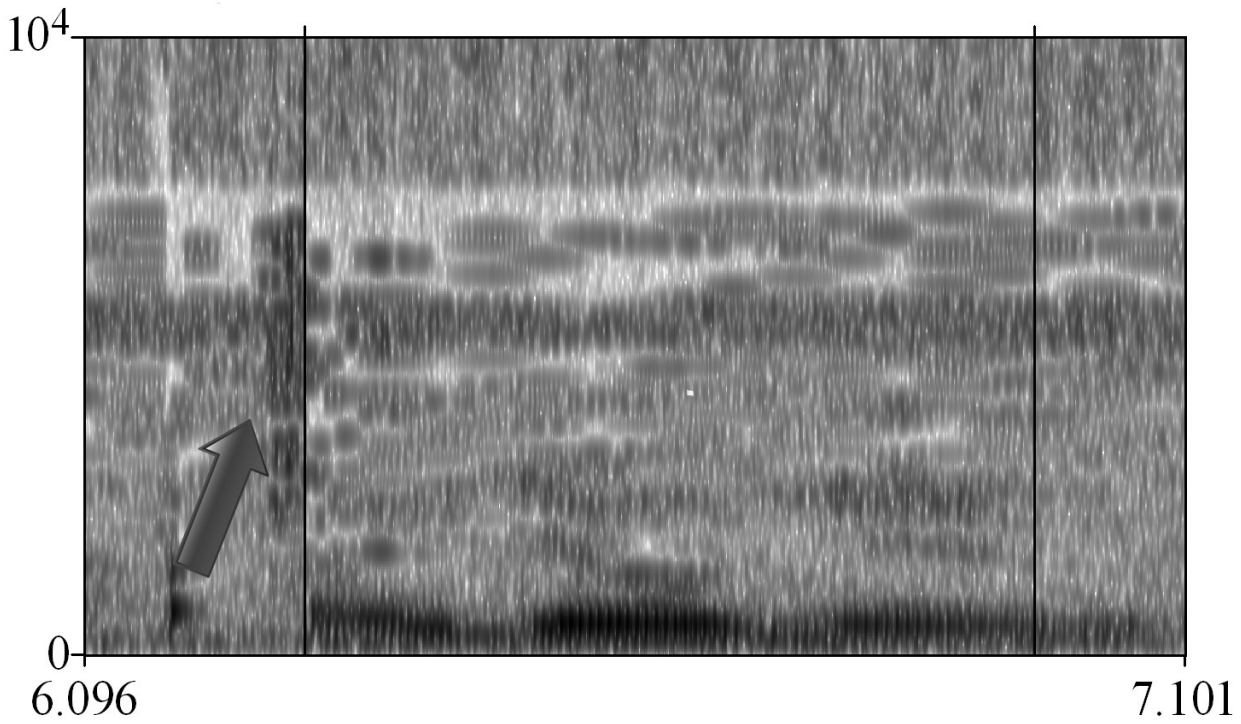


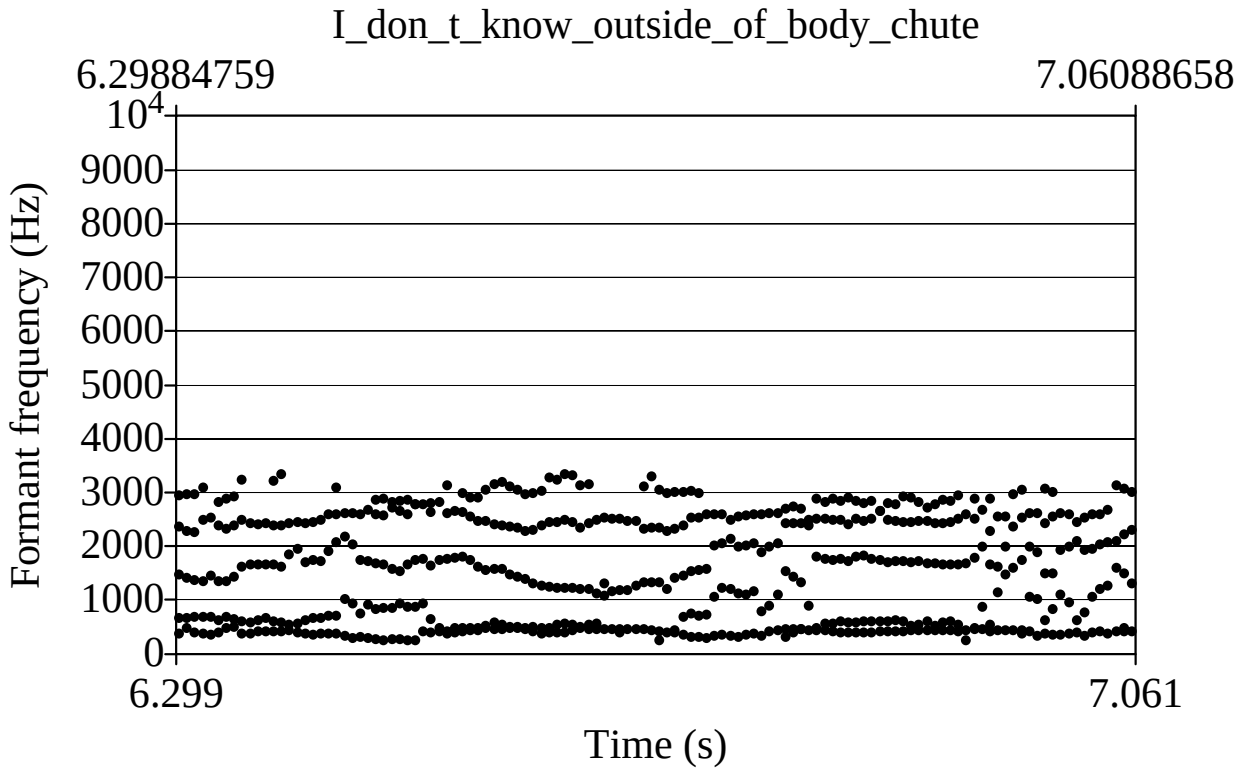
Figure above: Shows dark area of increased noise.

There does appear to be a mild difference in tone when comparing the subject voice to other voices within the recording. The subject recording has a decreased high frequency range and appears to be slightly more “muffled” in comparison to the rest of the file. There also seems to be a lack of echo which occurs only in the subject area.

Formants

The study of formants in spectrum analysis provides us with several interesting attributes of any sample audio file. It shows us not only the position of the tongue and mouth but also if the spoken word is indeed within the human vocal range. In addition formant structures show if the sound being heard is an actual articulated voice or simply background noise that’s subject to Pareidolia or apophenia *(the human propensity to make sense of random noise).*

The chart below is a representation of the first four formant lines of the subject file. Formant lines are numbered from the bottom up. Therefore the bottom row of formant points would represent "formant line1", the next line up would be "formant line 2" and so on.



I Don't Know

Our Formant Evaluation:

It appears there is some random noise within the second formant line and some along formant line 1 which can cause a bit of confusion in reading the frequencies of each, however there is enough information and clarity in the file to be fairly certain about the phoneme frequency levels. Establishing these levels allows us to analyze the file phonetically and determine the vowels and consonants being spoken.

Phonetic Analysis

Because of the muted nature of the segment, the consonant phonemes are unclear, however the vowel phonemes are fairly clear and in the three syllable statement presented for analysis, the following appears to be true:

First Syllable (word one) Vowel Phoneme:

Phoneme Symbol

/ɑɪ/

Formant Frequency 1: **577.9 Hz**

Formant Frequency 2: **1696.4 Hz**

Second Syllable (Word two) Vowel Phoneme:

Phoneme Symbol

/əʊ/

Formant Frequency 1: **449.5 Hz**

Formant Frequency 2: **1047.2 Hz**

Third Syllable (Word three) Vowel Phoneme:

Phoneme Symbol

/əʊ/

Formant Frequency 1: **572.9 Hz**

Formant Frequency 2: **1683.2 Hz**

Our Phonetic Evaluation:

Based upon the frequency separation of Formants 1 and 2 at the precise vowel locations for the subject file we can determine that the three words spoken contain Phoneme 14, 19 & 19 (which sound like: **Sky, Go, Go**) This coincides with the initial assessment from PRI-ME that the phrase spoken here is "**I don't know**" Because we can't gather proper consonant phonemes from the sample, we can only make an educated guess as to what is specifically being said. Based on this information and our audible assessment of the file we do concede that "I don't know" is in fact a distinct probability.

Formants list

The following chart represents the frequencies of each of the three main formants in the subject audio sample.

**Red entries denote the prime frequencies used in determining the phonetic structure.*

Time - Sec	Formant 1 - Hz	Formant 2 - Hz	Formant 3 - Hz
6.299061	650.69288	1477.332508	2411.931205
6.305311	660.419247	1410.366396	2249.728354
6.311561	674.272729	1384.63494	2244.313135
6.317811	668.003386	1325.533257	2354.365605
6.324061	682.914394	1439.343582	2519.157076
6.330311	640.438805	1399.100208	2497.507857
6.336561	582.192431	1318.381676	2344.211776
6.342811	715.183355	1392.645523	2353.884572
6.349061	581.706962	1544.518911	2456.003512
6.355311	579.934863	1643.191251	2448.759322
6.361561	591.17688	1653.588082	2394.023452
6.367811	652.968316	1654.697735	2405.908705
6.374061	617.231615	1661.050313	2399.075091
6.380311	594.353199	1639.657889	2383.778837
6.386561	551.370478	1635.718436	2380.88745
6.392811	534.549652	2023.290941	2462.068118
6.399061	**577.926945**	**1696.418433**	2419.104632
6.405311	658.223172	1740.253375	2434.96534
6.411561	636.757496	1684.628366	2429.650987
6.417811	688.816176	1862.7242	2568.352931
6.424061	686.662723	1929.550126	2565.784357
6.430311	999.846524	2226.059848	2605.738199
6.436561	965.74431	2074.47285	2611.128808

Time - Sec	Formant 1 - Hz	Formant 2 - Hz	Formant 3 - Hz
6.442811	800.555504	1917.576101	2581.459507
6.449061	881.624052	1723.23747	2648.022663
6.455311	839.282513	1700.15454	2674.894913
6.461561	843.772284	1664.989774	2486.799556
6.467811	823.017073	1620.577542	2738.885182
6.474061	896.786382	1521.81286	2634.381749
6.480311	912.888006	1612.960165	2670.547005
6.486561	836.337872	1686.640523	2564.582891
6.492811	1034.617224	1831.050185	2755.728744
6.499061	758.134141	1607.834429	2609.235204
6.505311	488.567244	1680.535112	2808.422982
6.511561	408.478892	1747.629561	2700.309217
6.517811	408.699224	1774.963173	2618.385521
6.524061	463.646466	1796.629556	2655.624915
6.530311	483.108157	1757.445372	2547.241959
6.536561	470.212053	1669.066789	2492.928474
6.542811	468.87985	1560.291099	2470.473051
6.549061	546.651308	1549.569957	2430.876429
6.555311	558.764217	1579.927933	2387.265824
6.561561	509.186794	1516.979056	2360.924505
6.567811	486.345088	1440.569818	2350.027514
6.574061	487.225209	1399.046034	2308.453479
6.580311	477.205748	1333.156713	2264.19366
6.586561	478.013318	1277.36753	2326.065637
6.592811	472.079949	1244.187177	2425.357019
6.599061	498.0552	1226.982476	2437.774817
6.605311	559.188403	1222.80439	2465.357908
6.611561	545.963768	1214.701766	2465.590253
6.617811	495.012842	1203.31571	2372.921954
6.624061	507.296203	1193.773623	2359.231599
6.630311	546.661403	1157.445952	2462.311789
6.636561	**449.505671**	**1047.224813**	2498.025766
6.642811	1114.503056	1159.995698	2516.067381
6.649061	446.042595	1168.540462	2498.162668
6.655311	445.264981	1153.421658	2478.860235
6.661561	1233.347726	2454.480403	--undefined--
6.667811	1283.134087	2370.243176	3037.862168
6.674061	1307.255635	2312.922707	3207.341465
6.680311	406.280786	1362.00422	2365.839884

Time - Sec	Formant 1 - Hz	Formant 2 - Hz	Formant 3 - Hz
6.686561	396.152562	1233.113091	2289.729645
6.692811	1227.343031	2279.756423	2983.895354
6.699061	669.249826	1445.450985	2340.317336
6.705311	719.728849	1474.914126	2477.58512
6.711561	712.398563	1542.052469	2514.410056
6.717811	693.63261	1553.030024	2571.96288
6.724061	1084.107699	1866.918704	2582.212726
6.730311	1144.918577	2000.693979	2584.828751
6.736561	1221.86649	2157.507856	2520.518781
6.742811	1170.294247	2030.091675	2519.811758
6.749061	1030.757729	1988.461148	2552.693444
6.755311	1139.629724	2053.157003	2576.538661
6.761561	1106.913954	1923.646688	2586.28536
6.767811	683.574904	1955.546652	2604.815978
6.774061	1037.613752	1999.614604	2602.269261
6.780311	446.425113	1454.733254	2472.177955
6.786561	448.353291	1494.083657	2407.168809
6.792811	454.516868	1388.315101	2440.11306
6.799061	996.104129	2392.451939	2631.461686
6.805311	493.53988	2015.504266	2488.520565
6.811561	515.989883	1759.764998	2529.442013
6.817811	564.501173	1756.827294	2480.336848
6.824061	581.578614	1752.52414	2499.113581
6.830311	577.212083	1733.535657	2405.68967
6.836561	560.895629	1765.153761	2469.794122
6.842811	581.172754	1817.286417	2473.620491
6.849061	587.618181	1782.938203	2475.204038
6.855311	577.358021	1751.383518	2623.839357
6.861561	610.524744	1698.772927	2520.949289
6.867811	600.35641	1693.256815	2464.066145
6.874061	606.05406	1729.293779	2452.013218
6.880311	544.628165	1700.530435	2432.840745
6.886561	495.474286	1695.455575	2455.81645
6.892811	592.09297	1700.777086	2452.028009
6.899061	545.395836	1665.985582	2444.999509
6.905311	540.323501	1667.716341	2413.626976
6.911561	589.363014	1643.734674	2433.061547
6.917811	574.330599	1663.40848	2471.99656
6.924061	462.444493	1643.441827	2573.945249

Time - Sec	Formant 1 - Hz	Formant 2 - Hz	Formant 3 - Hz
6.930311	439.084671	1732.207211	2542.546785
6.936561	634.139158	1951.113093	2619.000055
6.942811	**572.929753**	**1683.215291**	2386.436175
6.949061	435.611351	1680.233114	2384.420154
6.955311	1479.67373	1699.373075	2539.081329
6.961561	1488.620879	2403.670535	2907.582697
6.967811	424.743221	1701.82274	2416.031781
6.974061	981.243093	1899.747571	2601.811047
6.980311	1026.315887	1922.409157	2584.204754
6.986561	1111.960552	1966.139403	2782.380129
6.992811	685.75479	1498.244732	2497.827467
6.999061	1172.863924	1776.99443	2597.740327
7.005311	1009.92397	1965.233866	2587.37917
7.011561	825.859117	2047.649901	2544.307726
7.017811	715.954809	1942.420108	2466.224265
7.024061	869.424467	1949.605877	2570.761871
7.030311	1177.043764	1985.206115	2590.368144
7.036561	1203.199667	2064.3925	2568.818528
7.042811	1414.932404	2052.123788	3177.658928
7.049061	477.414632	1611.16058	2189.163824

What is a formant?

Formants *are defined as 'the spectral peaks of the sound spectrum of the voice'.* ***Formant*** *is also used to mean an acoustic resonance and, in speech science and phonetics, a resonance of the human vocal tract. It is often measured as an amplitude peak in the frequency spectrum of the sound, using a spectrogram or a spectrum analyzer, though in vowels spoken with a high fundamental frequency, as in a female or child voice, the frequency of the resonance may lie between the widely-spread harmonics and hence no peak is visible. In acoustics, it refers to a peak in the sound envelope and/or to a resonance in sound sources, notably musical instruments, as well as that of sound chambers. However, it is equally valid to talk about the formant frequencies of a room in which the sound was captured.*

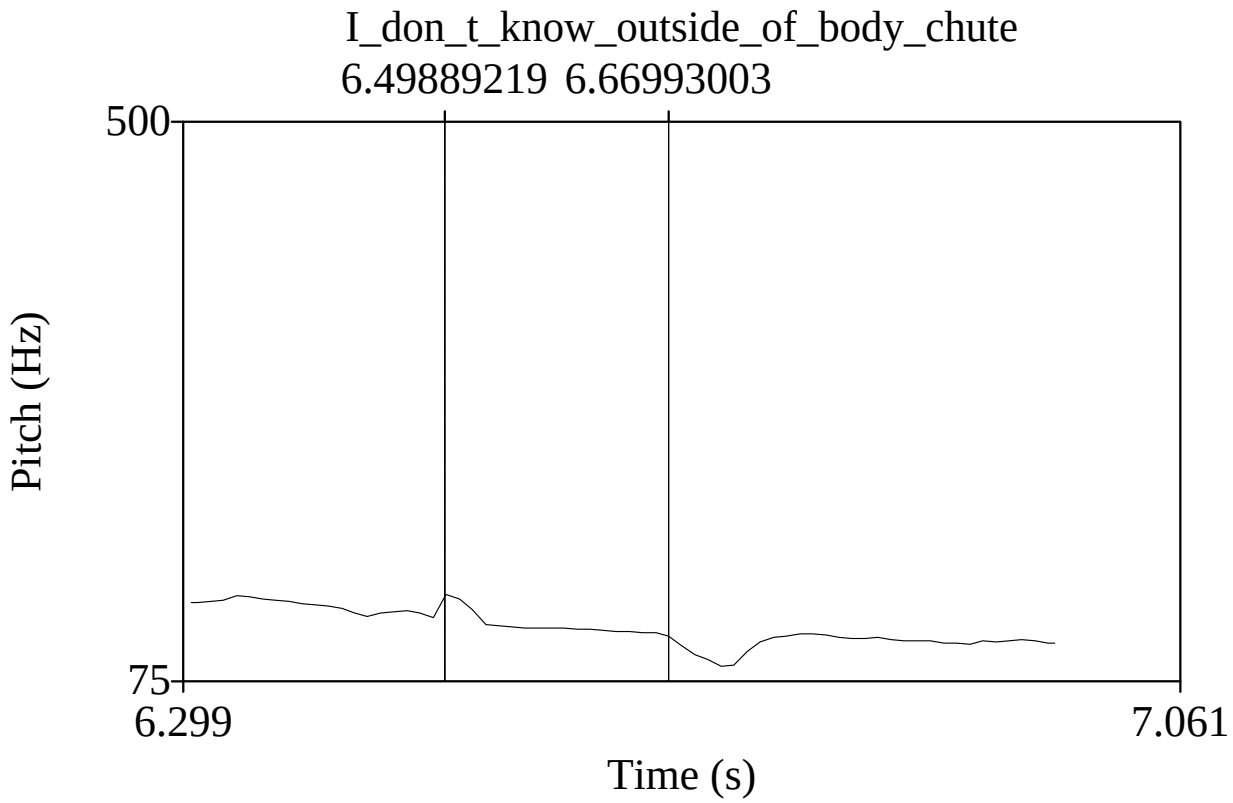
Chart: the 44 English phonemes

Index to number references and vowel / consonant sounds

Vowel Phonemes			Consonant Phonemes		
01	/ɪ/	pit	21	/p/	*p*it
02	/e/	pet	22	/b/	bit
03	/æ/	pat	23	/t/	time
04	/ɒ/	pot	24	/d/	door
05	/ʌ/	luck	25	/k/	cat
06	/ʊ/	good	26	/g/	*g*et
07	/ə/	ago	27	/f/	fan
08	/i:/	meat	28	/v/	van
09	/ɑ:/	car	29	/θ/	think
10	/ɔ:/	door	30	/ð/	that
11	/ɜ:/	girl	31	/s/	send

12	/u:/	t**oo**	32	/z/	**z**ip
13	/eɪ/	d**ay**	33	/m/	**m**an
14	/ɑɪ/	sk**y**	34	/n/	**n**ice
15	/ɔɪ/	b**oy**	35	/ŋ/	ri**ng**
16	/ɪə/	b**ee**r	36	/l/	**l**eg
17	/eə/	b**ea**r	37	/r/	**r**at
18	/ʊə/	t**our**	38	/w/	**w**et
19	/əʊ/	g**o**	39	/h/	**h**at
20	/aʊ/	c**ow**	40	/j/	**y**et
			41	/ʃ/	**sh**op
			42	/ʒ/	lei**s**ure
			43	/tʃ/	**ch**op
			44	/dʒ/	**j**ump

Pitch



What is pitch?

Pitch *represents the perceived* ***fundamental frequency*** *of a sound. It is one of the four major auditory attributes of sounds along with loudness, timbre and sound source location. When the actual fundamental frequency can be precisely determined through physical measurement, it may differ from the perceived pitch because of overtones, also known as upper partials, harmonic or otherwise. The human auditory perception system may also have trouble distinguishing frequency differences between notes under certain circumstances. According to ANSI acoustical terminology, it is the auditory attribute of sound according to which sounds can be ordered on a scale from low to high.*

Our Pitch evaluation:

Our pitch analysis of the subject file shows there are sharp changes in pitch located at 6.49 seconds and again at 6.66 seconds into the sample. We have found these changes do correspond appropriately with the remainder of the submitted file.

Our Findings

After our extensive analysis of the submitted file, we have found that the subject sample and segment (*located at 6.30 seconds*) does contain an articulated, anomalous (human) voice which appears to be speaking three, one syllable words. According to the phoneme analysis the file does seem to contain the words (or words similar to) **"I don't know".**

There does not appear to be any evidence of alteration from the original recorded file and the entire frequency spectrum of the audio recorder is intact. There does appear to be a 1600Hz frequency band located at 6037Hz which shows a lighter intensity in the background noise level. We feel this can be attributed to the noise cancellation circuit built into the Olympus audio recorder.

One particular peculiarity we did notice is a small patch of increased background noise located at 6.24 seconds. This patch lasts for a total of 6 seconds and occurs directly before the anomalous voice segment. Although there is an increase in noise, there isn't an increase in volume or intensity. We have no explanation for this occurrence.

We have also noted that the tonal structure and intensity of the subject segment appears to be different from the rest of the submitted file, which supports the hypothesis that this sample does contain an anomalous recording. The origin of this anomalous recording is yet unknown.

Based on the background noise to audio ratio we have

classified this file as CLASS A in clarity.