

08-69 A. 3/24/09

## Undergraduate Distance Education Review Form

(Required for all courses taught by distance education for more than one-third of teaching contact hours.)

Senate  
APP-3/24/09

Received

Course: PSYC481 – Special Topics: Psychology of Music

FEB 16 2009

Instructor(s) of Record: Donald U. Robertson

Liberal Studies

Phone: 724-357-4522

Email: durobert@iup.edu

Step One: Proposer

1. How is/are the instructor(s) qualified in the distance education delivery method as well as the

presentations. Last semester I began using Turnitin, the IUP supported plagiarism software, to aid evaluation of student papers.

Since that time my needs for computer assisted course

pitch. The effect is more easily understood if students can hear a particular melody along with its transposition to another key. In a regular classroom lecture, the example is typically presented one or two times, with the opportunity to "replay" the melodies in a traditional lecture but

can if the entire lecture is on-line.

A second advantage of on-line technology is the handling of quizzes. Quizzes are taken on-line and graded immediately. The content of the quiz is randomly sampled from a large item bank so that no two quizzes are the same. Students are permitted to take the quiz more than one time and only their highest grade is recorded. This "domain sampling" method of self-administered quizzes serves the function of helping the student review and learn the material more effectively (for example see Szpunar, *et al.*, 2008). Testing during study insulates against the buildup of

**Step Two: Departmental/Dean Approval**

(This course can be met via distance)

Negative

Mary Jo Smith  
Signature of Department Designee

2/11/09  
Date

Endorsed:

John D. Ed  
Signature of College Dean

2/16/09  
Date

Send form and supporting materials to Liberal Studies Office for consideration by the

**PSYC481 Special Topics  
Psychology of Music  
Online Course Syllabus**

Donald U. Robertson, Ph.D.  
222 Uhler Hall  
724-357-4522  
[durobert@iup.edu](mailto:durobert@iup.edu)

PSYC481 – Special Topics: Psychology of Music  
3c-01-3cr

Prerequisite: PSYC101 General Psychology

*This course provides an overview of theory and research on the psychological foundations of music including music cognition, music perception, and the social psychology of music.*

**Course Overview**

Music permeates our lives and, not surprisingly, services a wide range of psychological functions. It calms infants, gives identity to adolescents, evokes patriotic fervor, and deepens sorrow. Although much music is part of popular culture, there is ample evidence that music has been part of

3. Explain the psychological and neuropsychological basis for perception and processing of pitch, harmony, melody, and rhythm.
4. Describe factors related to development of musical ability and judge the relative contributions of talent and experience to musical development.
5. Identify psychological factors that influence music performance.
6. Summarize the relationship between music and emotion.

### Course Content

The course is organized into four units with two modules in each unit. A module consists of assigned readings, homework assignments, a set of lectures, and quizzes.

#### Unit 1: Fundamentals of music

Module 1: Origins and functions of music (2 lectures)  
 Readings: R & B 1, 2 and 3; Levitin Intro and Chapter 9.  
 Complete two assignments and take one quiz

Module 2: Psychoacoustics (3 lectures)  
 Readings: R & B 4; Levitin 1  
 Complete two assignments and take one quiz

UNIT 1 Examination covers Modules 1 and 2

#### Unit 2: Music Cognition

Module 3: Models of Rhythm (2 lectures)  
 Readings: R & B 5; Levitin 2  
 Complete two assignments and take one quiz

Module 4: Models of Melody and Harmony (3 lectures)  
 Readings: R & B 6; Levitin 3 & 4  
 Complete two assignments and take one quiz

UNIT 2 Examination covers Modules 3 and 4

#### Unit 3: Music Performance

Module 5: Talent and learning (3 lectures)  
 Readings: R & B 10; Levitin 7  
 Complete two assignments and take one quiz

Module 6: Psychological factors and performance (2 lectures)

UNIT 3 Examination covers Modules 5 and 6

**UNIT 4: Music and Socio-emotional Processes**

Module 7: Emotion and music (3 lectures)

Readings: R & B 8; Levitin 6

Complete two assignments and take one quiz

Module 8: Social psychology of music (2 lectures)

Readings: R & B 9; Levitin 8

Complete two assignments and take one quiz

UNIT 4 Examination covers Modules 7 and 8

**Course Grade**

... process of examinations, assignments and quizzes. There will be

... worth 50 points. The exams will consist of multiple choice and short answer

... that material and will

[The remainder of the page is obscured by heavy horizontal black redaction bars.]



All exams will be available at the start of the course but must be completed by the indicated deadline. Note that unlike the quizzes, you will be permitted to take an examination one time. This is designed to be the equivalent of an in-class examination. You should not use notes or your textbooks as resources to answer questions. The total time to take the test will be limited and you will not be permitted to return to a question. These procedures are in place to insure integrity of the testing process which is necessary for fairness.

## 6. Communications

There are three ways that we will communicate with each other. The most frequently used method is WebCT e-mail. Everyone has an account and should check their e-mail daily. I will check my e-mail at least once a day and will respond to your requests. A second method of communication is

through the Discussion Tool. We will use this forum for general questions about course content, ~~lectures and readings, and general discussion about psychology and music.~~ If you have

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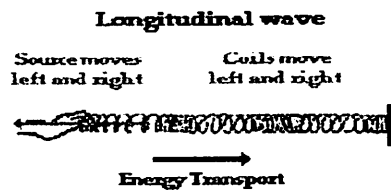
# Psychoacoustics: Properties of Sound

## Musical Sounds

- All musical instruments have something that vibrates
  - Strings for a guitar or piano
  - Reeds for an oboe or saxophone
  - Lips for a trumpet or trombone
  - Vocal folds for the human voice

## Mechanical Waves

- Vibration gets transferred and creates waves
- Mechanical wave – transfers energy mechanically



- Notice that the coil from the first push will take a while to reach the board

## Air Pressure

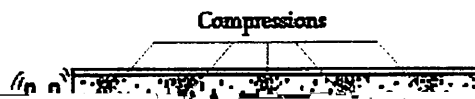
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- The air around us is filled with molecules
  - The more compressed the molecules, the higher the air pressure
  - The less compressed, the lower the air pressure
- Without a vibration, the air molecules distributed themselves evenly
  - This is called equilibrium

## Sound Waves

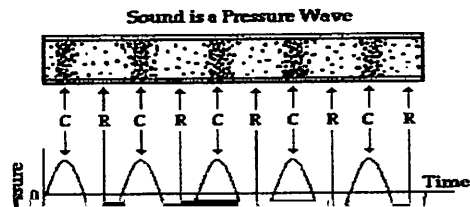
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- Vibration results in changes in air pressure
- Wave properties are the compression and rarefaction of air molecules



## Sound Waves

- Can be represented as changes in pressure over time
- Pressure changes are departures from equilibrium



## Wave Characteristics

- Idealized sound waves have a specific shape

Amplitude

## Wave Length or Frequency

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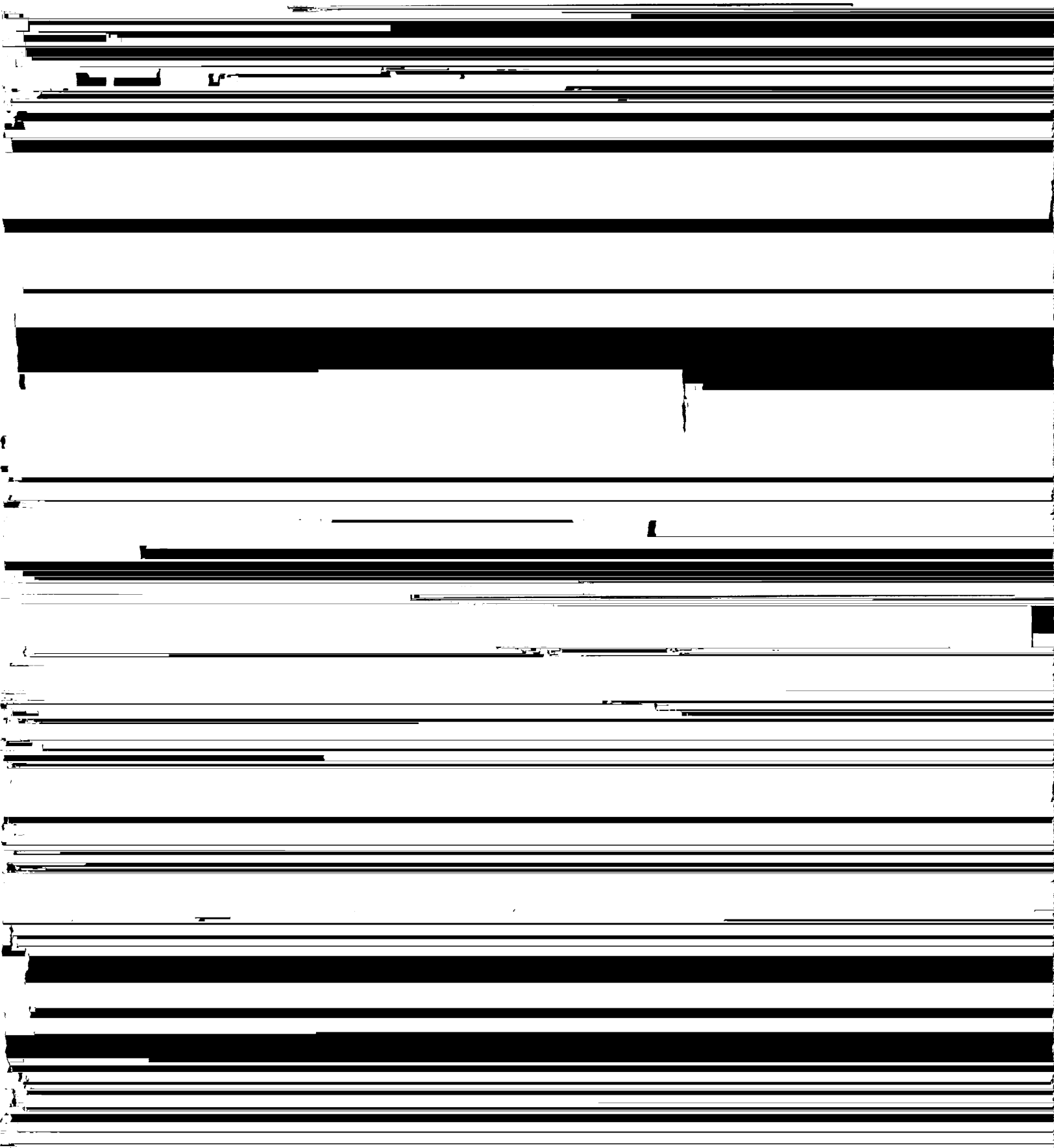
- Frequency – distance from one peak to the next
  - Measured in cycles per second or Hz
  - Humans can detect 20 to 20,000 Hz
  - Dogs: 50 to 45,000 Hz
  - Cats: 45 to 85,000 Hz

# Complex Waves (cont'd)

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W. R. ...





## Harmonic Spectrum

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- Musical sounds are complex and have components or harmonics at frequencies described by Fourier: The 2<sup>nd</sup> harmonic



## Harmonic Spectrum

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- Musical sounds are complex and have components or harmonics at frequencies described by Fourier: The 3<sup>rd</sup> harmonic



## Harmonic Spectrum

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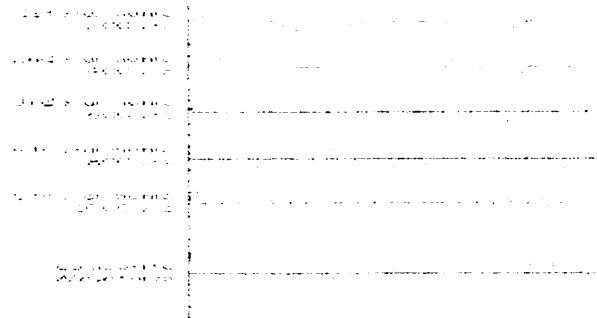
- Musical sounds are complex and have components or harmonics at frequencies described by Fourier: 4<sup>th</sup> and 5<sup>th</sup> harmonics



## Harmonic Spectrum

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- Musical sounds are complex and have components or harmonics at frequencies described by Fourier: The composite wave



## Harmonic Spectrum

- Note that the harmonic frequencies are multiples of the lowest harmonic:  $f = 200 \text{ Hz}$ ,  
 $2f = 400 \text{ Hz}$ ,  $3f = 600 \text{ Hz}$ , etc.

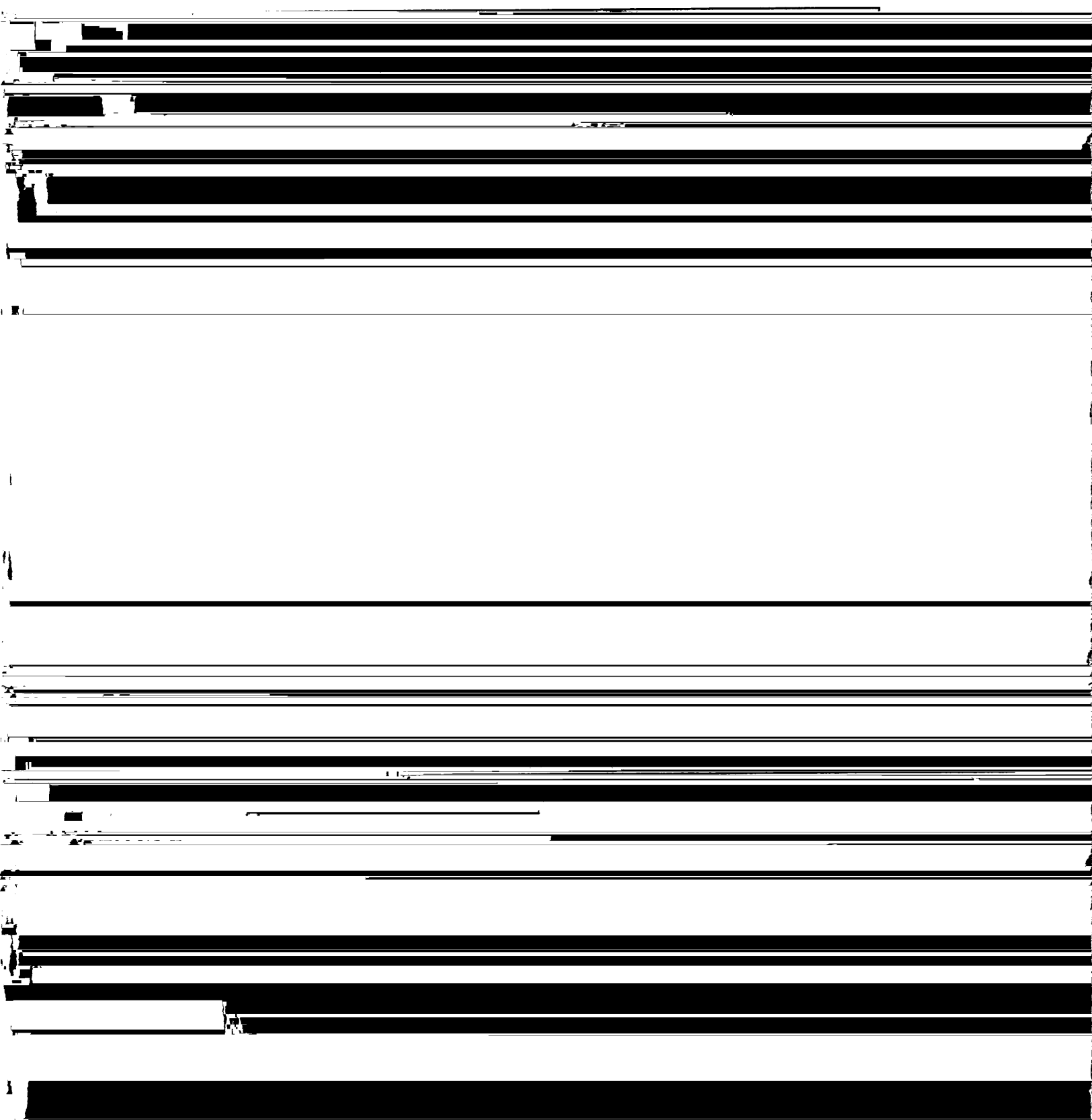
## Harmonic Spectrum Representation 1

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- Another way to represent a harmonic spectrum is to just show the amplitude for each component.
- For example, the previous spectrum would

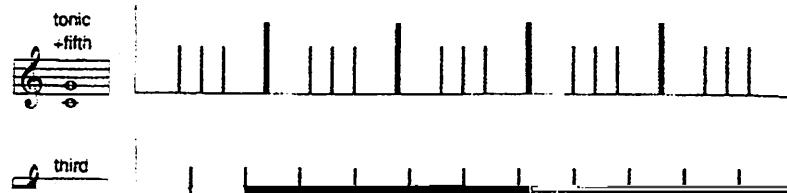
## Harmonic Spectra for Different Instruments

- Here are illustrations of harmonic spectra for different instruments each for the same tone – A 440 Hz



## Harmonic Spectra for Major Triad

- Here is the spectral representation of three notes that form a major triad





Harmonic Spectra for  
Major Triad and Inversions

# Harmonic Spectra for Major Triad and Inversions

Note that the different sounds for the same

# Correspondence to Keyboard

Frequency	Keyboard	Note name	MIDI number
4186.0		C8	108
3727.3		D7	107
3322.4		A7	106
2960.0		F7	105
2637.6		G7	104
2349.0		E7	103
2093.0		D7	102
1875.5		C7	101
1684.7		B6	100
1516.2		A6	99
1368.0		G6	98
1238.5		F6	97
1124.7		E6	96