

Analysis of Helicopter Audio Recordings

MathWorks

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Abstract

You can use MATLAB Report Generator for any reporting you need to do in MATLAB. MATLAB Report Generator is especially useful when you need to repeat the same data analysis for multiple data sets and document the results. To document analysis results for just one data file you could manually create a report (for example, in Microsoft Word) by manually copying and pasting your plots and tables into a document. However, when you need to document analysis results for multiple data sets, copying and pasting manually becomes tedious. That is when MATLAB Report Generator comes to rescue. In this demo we show how MATLAB Report Generator can automate reporting of data analysis results for six helicopter sound recordings. For each of the six sound recordings we want to automatically determine if the recording is clipped and to automatically create a time history plot and a power spectral density plot. We also want to create a summary table automatically with information about how many sound recordings were clipped and which ones they were. Once we create report setup file to document our analysis of six sound recordings, we can easily apply it to document analysis of an arbitrary number of data sets.

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Chapter 1. Introduction

This document contains an analysis of a set of helicopter audio recordings. The analysis was performed by MATLAB. In fact, this document was automatically generated by MATLAB Report Generator. All the audio files in the directory D:\Copter_Sound_Analysis\Helicopter Data were analyzed:

field	1	2	3	4	5	6
name	Chinook.wav	Comanche.wav	Huey.wav	Mdnotar2.wav	Osprey.wav	Seanight.wav
date	05-Jan-2005 10:09:07	05-Jan-2005 10:09:07	05-Jan-2005 10:09:08	05-Jan-2005 10:09:08	05-Jan-2005 10:09:08	05-Jan-2005 10:09:08
bytes	477794	216134	257902	100046	220544	454274
isdir	0	0	0	0	0	0
datenum	732317.423	732317.423	732317.423	732317.423	732317.423	732317.423

Chapter 2. Analysis

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The same analysis is automatically applied to all files. First, the integrity of the data is checked. Any signals that are found to be clipped are indicated with a yellow time series plot. The power spectral density is estimated using Welch's method. The default settings of eight equal-length segments with 50% overlap are used.



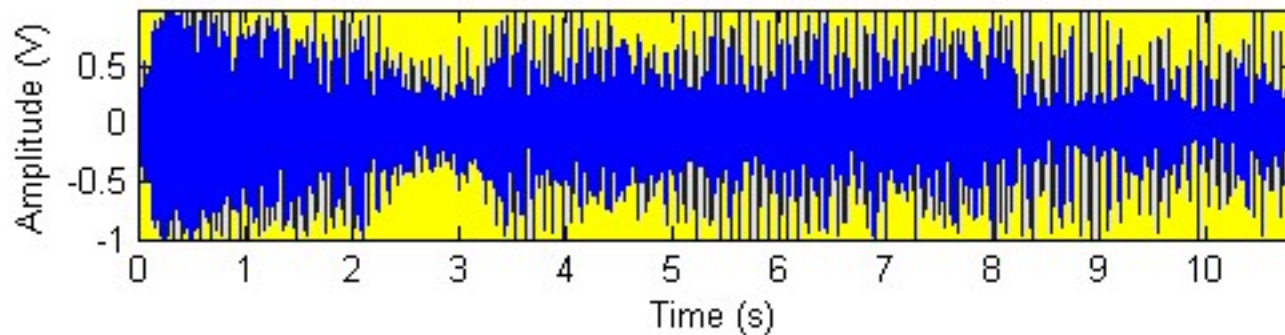
1. Analysis of Chinook.wav

Play original file [file:///D:\Copter_Sound_Analysis\Helicopter Data\Chinook.wav]

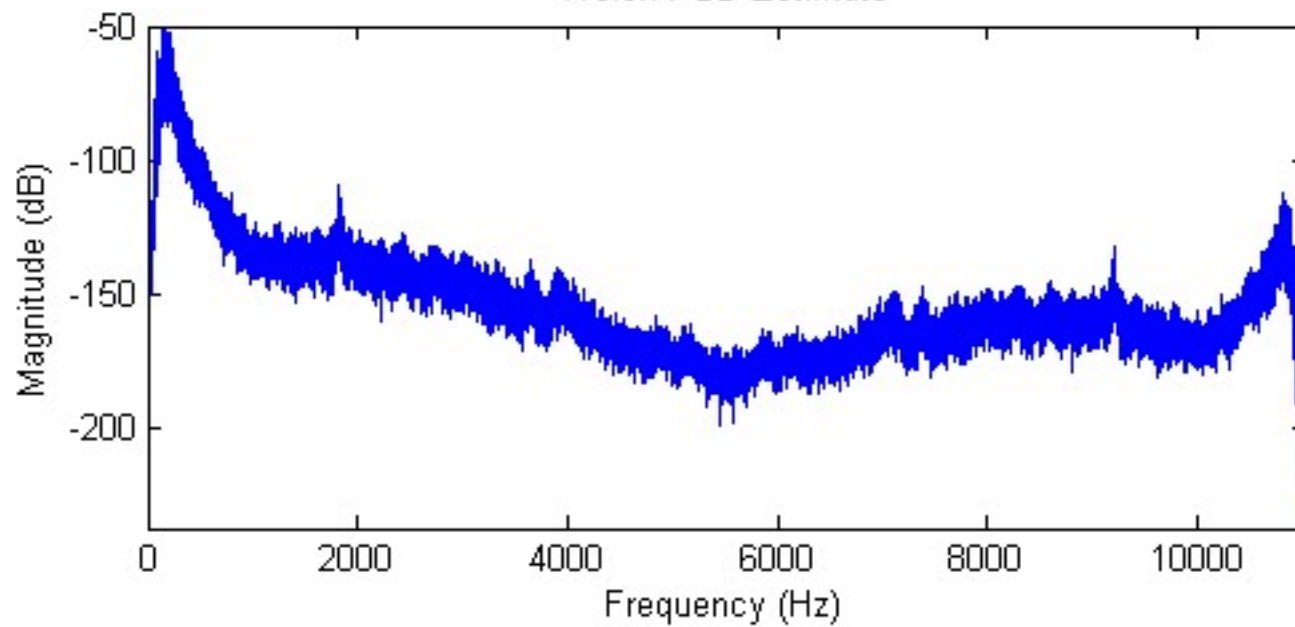


Chinook

Time Series



Welch PSD Estimate





This recording is clipped, so take the results with a grain of salt. This recording is not clipped, so you can trust the results.



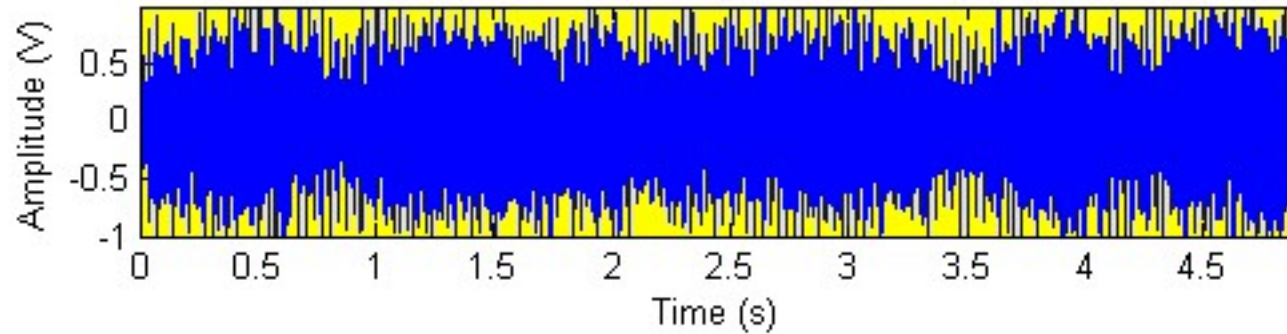
2. Analysis of Comanche.wav

Play original file [file:///D:\Copter_Sound_Analysis\Helicopter Data\Comanche.wav]

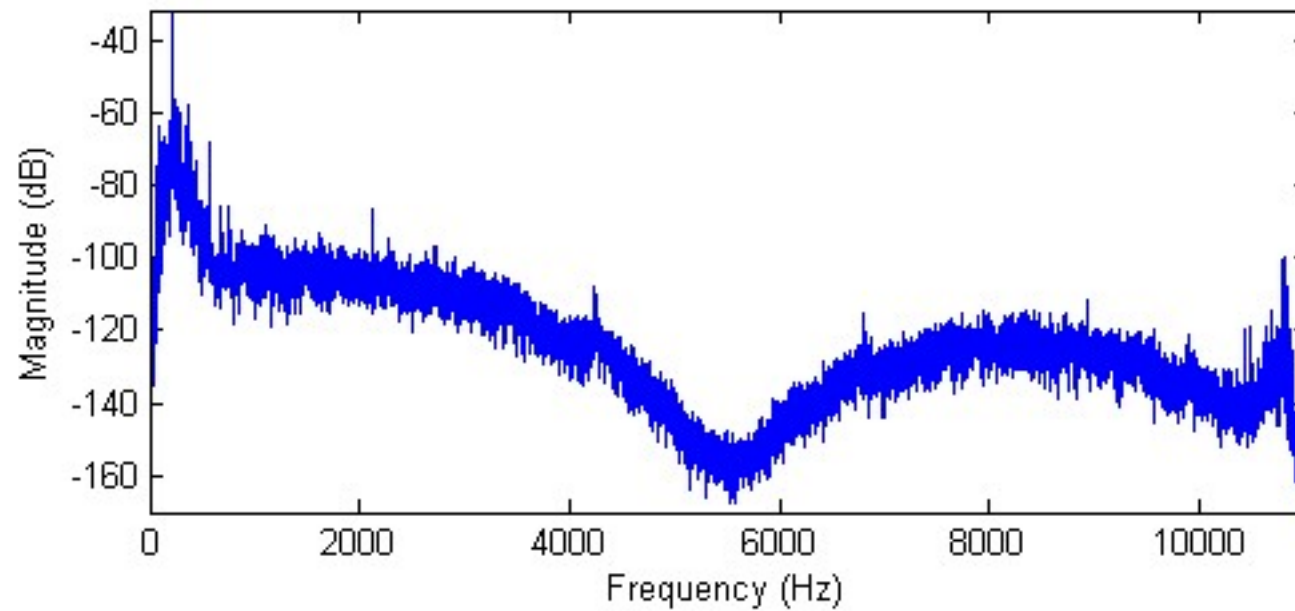


Comanche

Time Series



Welch PSD Estimate





This recording is clipped, so take the results with a grain of salt. This recording is not clipped, so you can trust the results.



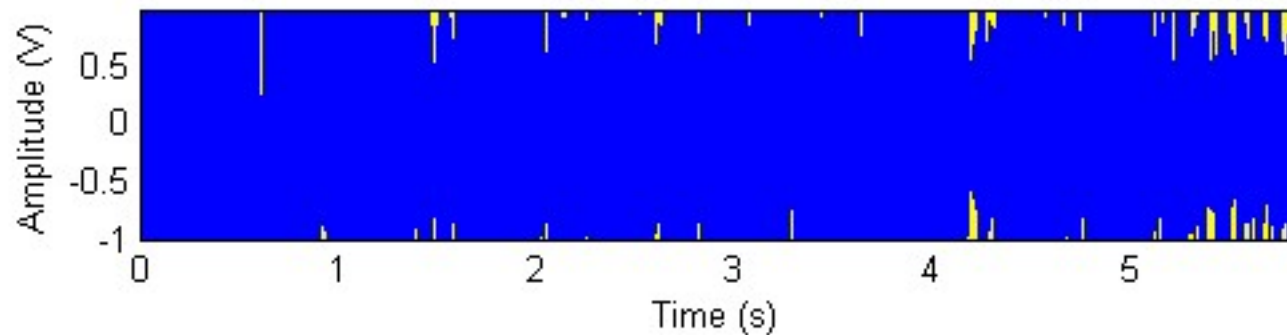
3. Analysis of Huey.wav

Play original file [file:///D:\Copter_Sound_Analysis\Helicopter Data\Huey.wav]

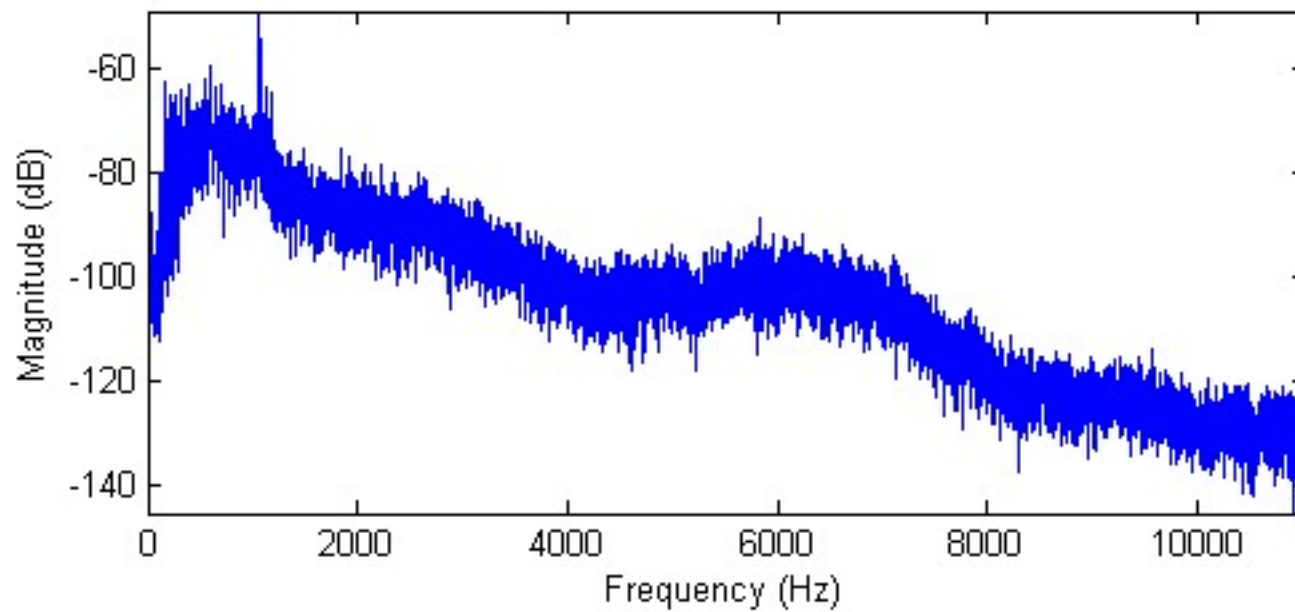


Huey

Time Series



Welch PSD Estimate





This recording is clipped, so take the results with a grain of salt. This recording is not clipped, so you can trust the results.



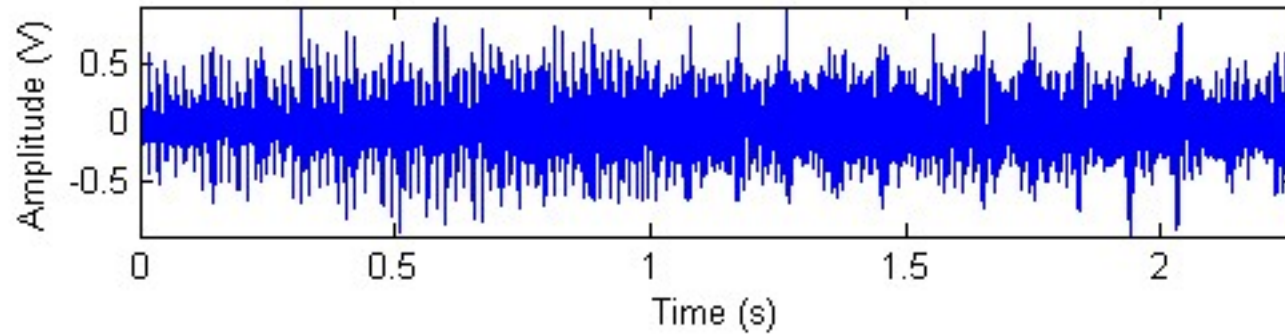
4. Analysis of Mdnotar2.wav

Play original file [file:///D:/Copter_Sound_Analysis/Helicopter Data/Mdnotar2.wav]

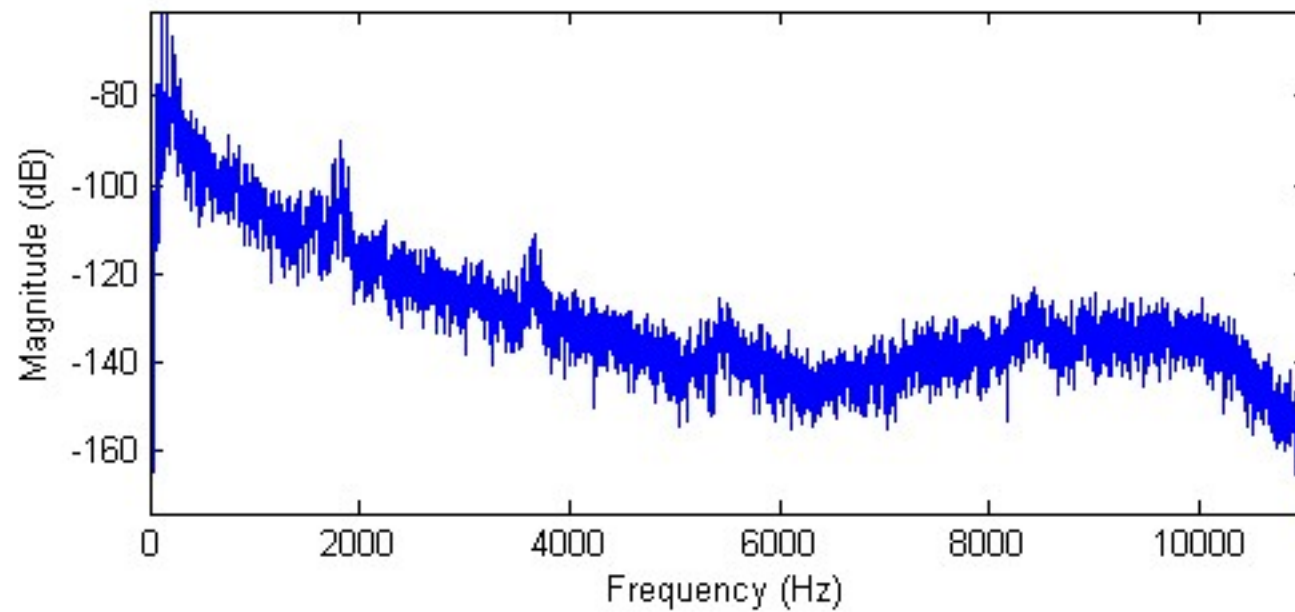


Mdnotar2

Time Series



Welch PSD Estimate





This recording is not clipped, so you can trust the results.



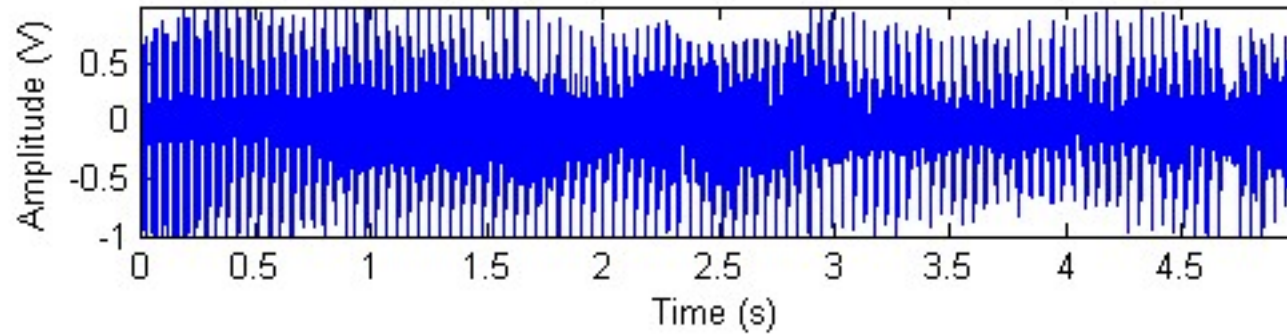
5. Analysis of Osprey.wav

Play original file [file:///D:\Copter_Sound_Analysis\Helicopter Data\Osprey.wav]

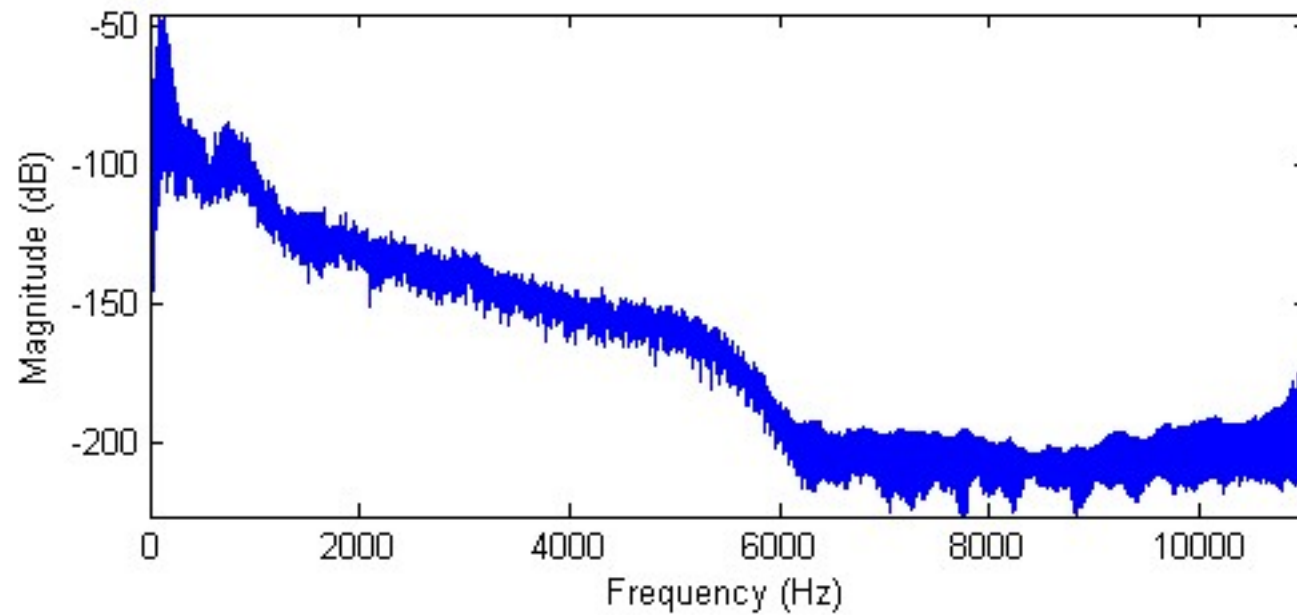


Osprey

Time Series



Welch PSD Estimate





This recording is not clipped, so you can trust the results.



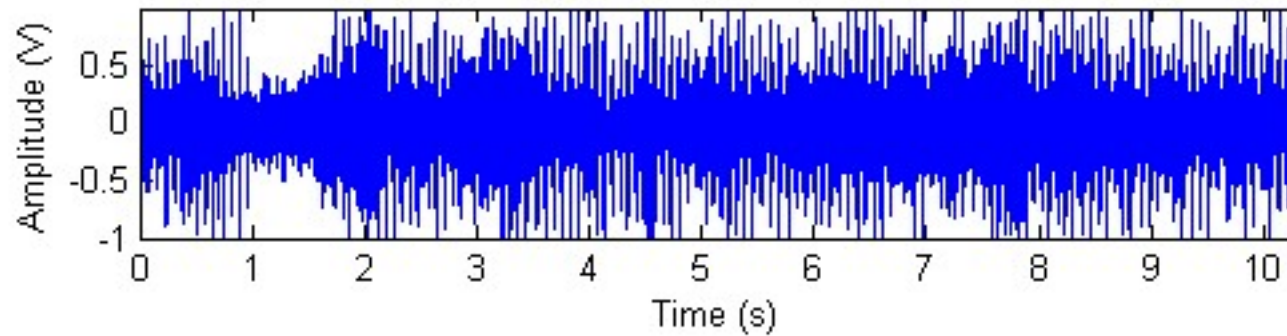
6. Analysis of Seanight.wav

Play original file [file:///D:\Copter_Sound_Analysis\Helicopter Data\Seanight.wav]

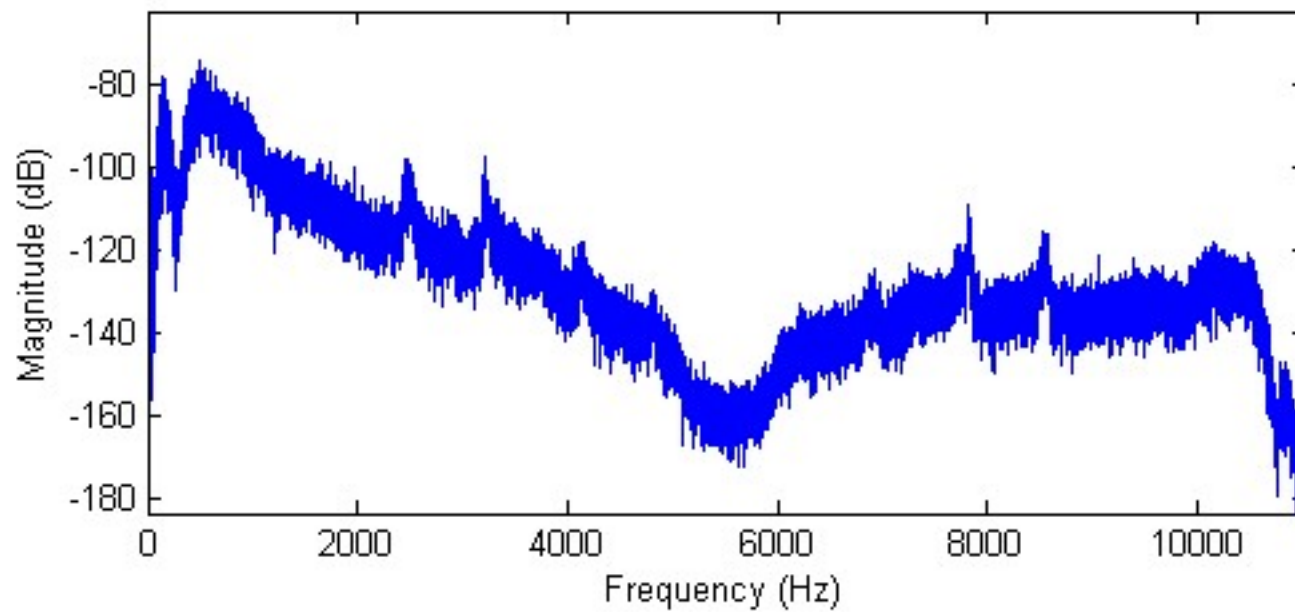


Seanight

Time Series



Welch PSD Estimate





This recording is not clipped, so you can trust the results.

Chapter 3. Summary

A total of 6 files were processed, and 3 of those recordings were clipped. Specifically, the following recordings were clipped:

Chinook.wav

Comanche.wav

Huey.wav