

# JadeSpectrogram Manual

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## 1 Introduction

Dear User,

a spectrogram is not the sexiest of all plug-ins, but sometimes very versatile. This incarnation comes as a plug-in version and is highly flexible in terms of its analysis parameters. You can tune it for your purposes. I hope you will enjoy using it and gaining knowledge for acoustical or musical problems.

Have fun!

Joerg aka audio-dsp.

## 2 Installation

The downloaded file is a standard zip file. It contains a readme.txt, a plug-in directory (.vst3 or .component), and this manual for your OS. The first step is to copy the directory to the right place for VST3 / AU files.

### 2.1 Windows

For Windows<sup>™</sup> the standard VST3-directory is:

c:\Program Files\Common Files\VST3

### 2.2 Mac VST

If you use the VST3 plugin, copy the .vst3 directory to

/Users/yourUSERNAME/Library/Audio/Plug-Ins/VST3

### 2.3 Mac AudioUnit

If you use the AudioUnit plugin, copy the .component file/directory to

/Users/yourUSERNAME/Library/Audio/Plug-Ins/Components

### 2.4 Linux

For Linux copy the full directory to:

/home/YourUSERNAME/.vst3/

### 3 How to use

JadeSpectrogram has two main areas: The analysis window in the middle, and all parameter settings at the left and right side and at the bottom.



#### 3.1 Parameters Left (1)

On the left side the two sliders reduce the displayed frequency region. This does not change the analysis, and the final content of the analysis window is an interpolated version of the original data. A small frequency interval between upper and lower frequency leads to blurry content.

#### 3.2 Parameters Right (2)

On the right side the two sliders will change the upper and lower boundaries of the used colourmap. This allows for higher contrast in regions you are most interested in.

#### 3.3 Parameters Bottom (3,4,5,6,7,8)

- Stop analysis button (3): This button will stop the running display to allow for closer analysis.
- Window selector (4): The short-time Fourier-transform divides the signal into small blocks. To reduce some artefacts different windows can be used. When in doubt use the Hann window as a starting point.
- Frequency display (5): This small display shows the frequency in Hz and in note numbers of the current position of the mouse in the analysis window. This is a very versatile tool, e.g. to analyse melody tracks.

- FFT size (6): This combo-box changes the block-size and the FFT-size of the analysis. Use higher values for detailed frequency analysis and lower values for timing analysis.
- Display mode (7): Choose between two display styles: either running analysis time or running spectrogram
- Colourmap selector (8): Change the colourmap to your taste. If you want to show results to others keep in mind that some colourmaps are better suited than others. Modern colourmaps (viridis or plasma) are equally spaced in their brightness perception and suitable for colourblind people.

### 3.4 Analysis Display

The huge main area is the analysis display. It shows the last few seconds of the analysed signal on the x-axis vs frequency on the y-axis. The power of the frequency content is represented by different colors. Usually, the brighter the colours, the more power there is at that frequency. The power values are more or less arbitrary, since we are in the digital domain without calibration with regard to sound pressure level (SPL).

## 4 Further topics

If you want to dive into signal analysis, the spectrogram is just the beginning. I really recommend the web-site of Prof. Julius O. Smith III <https://ccrma.stanford.edu/~jos/sasp/>.

### 4.1 Source code

This plug-in is open source. you can find the source code here:

<https://github.com/JoergBitzer/JadeSpectrogram>

This plug-in belongs to a longer list of plug-ins developed for educational purposes. In order to build JadeSpectrogram for yourself, you should start with

<https://github.com/JoergBitzer/AudioDevOrga>

I am aware that the quality of the code leaves room for improvement. However, if you are familiar with JUCE, you will have no problem to understand what's going on. Please report issues at the GitHub repository.

### 4.2 More Web links

<https://www.musicdsp.org/>

## 5 Legal stuff

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