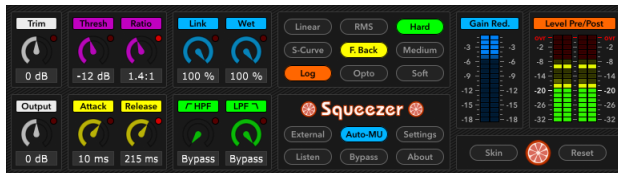


Squeezer

Flexible general-purpose audio compressor
with a touch of citrus



Last edited on 29th March 2020



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1 About Squeezer

I wrote this compressor to learn all I could about audio compression. It took me several months to gather all the specs and papers I needed and convert them into code.

Squeezer is different from all the compressors I know: its knobs are stepped to fine-tuned *preset* values, but can be changed to *continuous* values by clicking a small red light located next to them. This allows you to find nice settings fast while not preventing to optimise these settings.

Squeezer is also very flexible. Its internals can be changed in many ways:

- feed-forward & feed-back design
- linear, S-curve & logarithmic reaction
- optical & FET detectors
- (almost) peak & RMS sensing
- hard, medium & soft knee

Squeezer has given me a deep insight into audio compressors. But it has also quickly become my go-to generic compressor!

2 What is compression?

2.1 The tale of the bar keeper

Once upon a time there was a bar. Customers enjoyed their drinks and music played in the background. After a while, the bar keeper noticed that his drinks sold best when the music had a certain loudness. Unfortunately, almost every record they played had a different loudness.

So he bought a loudness meter and wrote a set of instructions for the DJ:

80 dB SPL	set mixer's output gain to 0 dB
85 dB SPL	set mixer's output gain to -5 dB
90 dB SPL	set mixer's output gain to -10 dB
95 dB SPL	set mixer's output gain to -15 dB

This worked quite well and he could finally afford to buy a shiny new bar counter. Upon which the DJ gave notice (he had always dreamt of getting a *stereo* mixer, so the new counter didn't go down too well with him).

After an initial shock, the bar keeper was quite content. The DJ really *had* been lousy. But how to keep the high number of drinks?

Being an entrepreneur, the bar keeper took his challenge and connected the mixer's output to a simple amplifier. The amplifier's input gain was regulated by a level sensor which in turn was connected to the amplifier's output – a classic negative feed-back loop.

Although the new device exactly followed the DJ's instructions (and didn't smell as bad), customers complained about its bad sound. The bar keeper had invented a *wave shaping* device – gain changes were applied instantly which *distorted* its output signal.

Fortunately, the bar keeper remembered a very important thing: the DJ had often been drunk and taken his time to apply gain changes. So the bar keeper improved his device by smoothing the level sensor's output.

He could have become very rich. But he didn't realise the magnitude of his invention and continued being a happy bar keeper. Which is not the worst thing, when you come to think of it.

To this day, however, sound engineers fall silent in awe when they hear his name – the name of the bar keeper who **invented the compressor**.

3 Installation

In order to use the pre-compiled binaries, simply extract the Squeezer files from the downloaded archive. For the plug-ins, you'll then have to move the extracted files to your respective plug-in folder.

Squeezer requires a processor which supports the SSE2 instruction set. On Windows, you might also have to install the [Visual C++ Redistributable for Visual Studio 2017](#).

Should the stand-alone version ever fail to start, you can reset its settings by deleting the file `squeezer_stereo.ini` or `squeezer_mono.ini`. These files are located in `~/.config` (GNU/Linux) or `%appdata%\config\` (Windows).

4 Controls

Sorry, I have yet to find enough time to write this manual.

5 Final words

I want to express my gratitude to the **Audio Engineering Society** for their wonderful E-Library. This includes everybody who wrote the fine papers within the library, especially Dimitrios Giannoulis, Michael Massberg and Joshua D. Reiss.

I must also thank the **beta testers** and **users of Squeezer** for sending kind words, suggestions and bug reports. Finally, I want to thank the **open source community** for making all of this possible.

Although coding Squeezer has been a lot of fun, it has also been a lot of work. So if you like Squeezer, why not send me a short email and tell me so? Write a few words about yourself, send suggestions for future updates or volunteer to create a nice skin. I also really enjoy listening to music that you have produced using my software ...

Here is my email address (please remove “-nospam”):

"Martin Zuther" <code-nospam@mzuther.de>

Thanks for using free software. I hope you'll enjoy it!

A Build Squeezer

A.1 Dependencies

A.1.1 premake

Importance: required

Version: 5.0.0 (alpha13)

License: BSD

Homepage: premake.github.io

Installation

Place the binary somewhere in your PATH. Depending on your platform, you should run premake using the scripts `Builds/run_premake.sh` or `Builds/run_premake.bat`.

To change the premake file using the provided Jinja templates, you'll also have to install the necessary dependencies.

A.1.2 JUCE library

Importance: required

Version: 5.3.2

License: ISC and GPL v3 (among others)

Homepage: www.juce.com

Installation

Extract the archive into the directory `libraries/juce`.

If you want to build the LV2 plug-in, please extract the archive `distrho_lv2-xxxxxxxx.tar.gz` into the same directory.

A.1.3 Virtual Studio Technology SDK

Importance: optional

Version: 2.4 / 3.6.8

License: proprietary / GPL v3

Homepage: www.steinberg.net

Installation

Just extract the archive into the directory `libraries/vst`.

A.1.4 Python

Importance: optional

Version: 3.5 (or higher)

License: Python Software Foundation License

Homepage: www.python.org

You'll only need Python if you want to change the premake file (see [section A.1.1](#)) using Jinja templates.

Installation (Windows)

You can download an installer from the website.

A.1.5 Jinja

Importance: optional

Version: 2.8 (or higher)

License: BSD

Homepage: jinja.pocoo.org

You'll only need Jinja if you want to change the premake file using templates (see [section A.1.1](#)).

A.1.6 Artistic Style

Importance: optional

Version: 2.05.1

License: LGPL v3

Homepage: astyle.sourceforge.net

This application formats the code so it looks more beautiful and consistent. Thus, you only have to install it if you plan to help me with coding Squeezer.

Installation

Place the binary somewhere in your PATH. Depending on your platform, you should run `astyle` using the scripts `Source/format_code.sh` or `Source/format_code.bat`.

A.2 GNU/Linux

A.2.1 Environment

To build Squeezer yourself, I recommend setting up a chroot environment. This is fast and easy to do on Debian-based systems and might save you a **lot** of trouble. At the time of writing, I'm using Linux Mint 19, but the procedure should be similar on your distribution of choice.

Start by installing the necessary packages:

32 and 64 bit

```
sudo apt-get install debootstrap schroot
```

Then install the chroot base system by executing the following statements:

32 bit

```
sudo debootstrap --variant=buildd \  
  --arch i386 bionic \  
  /srv/chroot/bionic_i386 \  
  http://archive.ubuntu.com/ubuntu
```

64 bit

```
sudo debootstrap --variant=buildd \  
  --arch amd64 bionic \  
  /srv/chroot/bionic_amd64 \  
  http://archive.ubuntu.com/ubuntu
```

Running debootstrap will take some time. Meanwhile, add the following lines to `/etc/schroot/schroot.conf` (make sure you remove all preceding white space so that each line begins in the first column):

```
32 and 64 bit
[bionic-i386]
description=Ubuntu bionic (i386)
directory=/srv/chroot/bionic_i386
profile=default
personality=linux32
type=directory
users=username

[bionic-amd64]
description=Ubuntu bionic (amd64)
directory=/srv/chroot/bionic_amd64
profile=default
personality=linux
type=directory
users=username
```

Please make the necessary changes to `username`. If you experience problems, you can try to change `bionic` to a release name such as `wheezy`.

When debootstrap is done, log in as superuser:

```
32 bit
sudo schroot -c bionic-i386
```


64 bit

```
sudo schroot -c bionic-amd64
```

You'll have to change the file `/etc/apt/sources.list` first (ignore the line break, it should be a single line):

32 and 64 bit

```
deb http://archive.ubuntu.com/ubuntu bionic  
main restricted universe
```

Now install a few packages – `less` and `vim` are optional, but might come in handy:

32 and 64 bit

```
apt-get update  
apt-get -y install bash-completion clang \  
    libasound2-dev libjack-jackd2-dev \  
    mesa-common-dev xorg-dev less vim  
apt-get clean
```

If you like bash completion, you might also want to open the file `/etc/bash.bashrc` and unquote these lines:

32 and 64 bit

```
# enable bash completion in interactive shells  
if [...]  
    [a couple of lines...]  
fi
```

Finally, log out and log in as normal user:

32 bit

```
schroot -c bionic-i386
```

64 bit

```
schroot -c bionic-amd64
```

In this chroot shell, install the dependencies ([section A.1](#)). Congratulations – you are now ready to build Squeezer!

A.2.2 Build

After preparing the dependencies, start your chroot environment

32 bit

```
schroot -c bionic-i386
```

64 bit

```
schroot -c bionic-amd64
```

change into the directory `build` and execute

32 and 64 bit

```
./run_premake.sh  
make config=CFG TARGET
```

where `CFG` is one of `debug_x32`, `debug_x64`, `release_x32` and `release_x64`, and `TARGET` is the version you want to compile, such as `linux_standalone_stereo`.

In case you run into problems, you can try to switch compilers by opening the file `run_premake.sh` and using the premake options `--cc=clang` or `--cc=gcc`.

The compiled binaries will end up in the directory `bin`.

A.3 Microsoft Windows

A.3.1 Build

After preparing the dependencies, change into the directory `build` and execute

32 and 64 bit

```
./run_premake.bat
```

Then change into the directory `Builds/windows/vs20xx`, open the project file with the corresponding version of Visual C++ and build the project.

The compiled binaries will end up in the directory `bin`.

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