

# Contents

<b>Convertron3000</b>	<b>3</b>
<b>Why Convertron3000?</b>	<b>3</b>
<b>Usage</b>	<b>4</b>
<b>Commandline options</b>	<b>4</b>
<b>Dithering</b>	<b>4</b>
<b>Brightness palette</b>	<b>5</b>
<b>File Formats</b>	<b>5</b>
<b>Authors</b>	<b>6</b>
<b>Getting Started</b>	<b>7</b>
Run the standalone executable . . . . .	7
Note for Windows users . . . . .	7
Note for MacOS users . . . . .	7
Run the Python3 script directly . . . . .	7
Prerequisites . . . . .	7
<b>Changelog</b>	<b>9</b>
Future plans . . . . .	9
Changes in 1.34 . . . . .	9
Changes in 1.33 . . . . .	9
Changes in 1.32 . . . . .	9
Changes in 1.31 . . . . .	9
Changes in 1.3 (on X2024) . . . . .	9
Changes in 1.2 . . . . .	9
Changes in 1.1 . . . . .	10
Changes in 1.01 . . . . .	10
Changes in 1.0 . . . . .	10
Changes in 0.1 . . . . .	10
<b>License</b>	<b>11</b>
<b>GNU General Public License</b>	<b>12</b>
Preamble . . . . .	12
TERMS AND CONDITIONS . . . . .	13
0. Definitions . . . . .	13
1. Source Code . . . . .	14
2. Basic Permissions . . . . .	14
3. Protecting Users' Legal Rights From Anti-Circumvention Law	15
4. Conveying Verbatim Copies . . . . .	15

5. Conveying Modified Source Versions . . . . .	15
6. Conveying Non-Source Forms . . . . .	16
7. Additional Terms . . . . .	18
8. Termination . . . . .	19
9. Acceptance Not Required for Having Copies . . . . .	20
10. Automatic Licensing of Downstream Recipients . . . . .	20
11. Patents . . . . .	20
12. No Surrender of Others' Freedom . . . . .	22
13. Use with the GNU Affero General Public License . . . . .	22
14. Revised Versions of this License . . . . .	22
15. Disclaimer of Warranty . . . . .	23
16. Limitation of Liability . . . . .	23
17. Interpretation of Sections 15 and 16 . . . . .	23
How to Apply These Terms to Your New Programs . . . . .	23
<b>Python 3 license</b>	<b>25</b>
<b>The Python Imaging Library (PIL)</b>	<b>26</b>
<b>Tcl/Tk License Terms</b>	<b>26</b>
<b>hitherdither-library</b>	<b>27</b>
<b>argparse</b>	<b>28</b>
History . . . . .	28

## Convertron3000

Convertron3000 is a graphics converter for Commodore 64 computers. It runs on 64 bit versions of Linux, MacOS, Windows and other systems supported by Python.

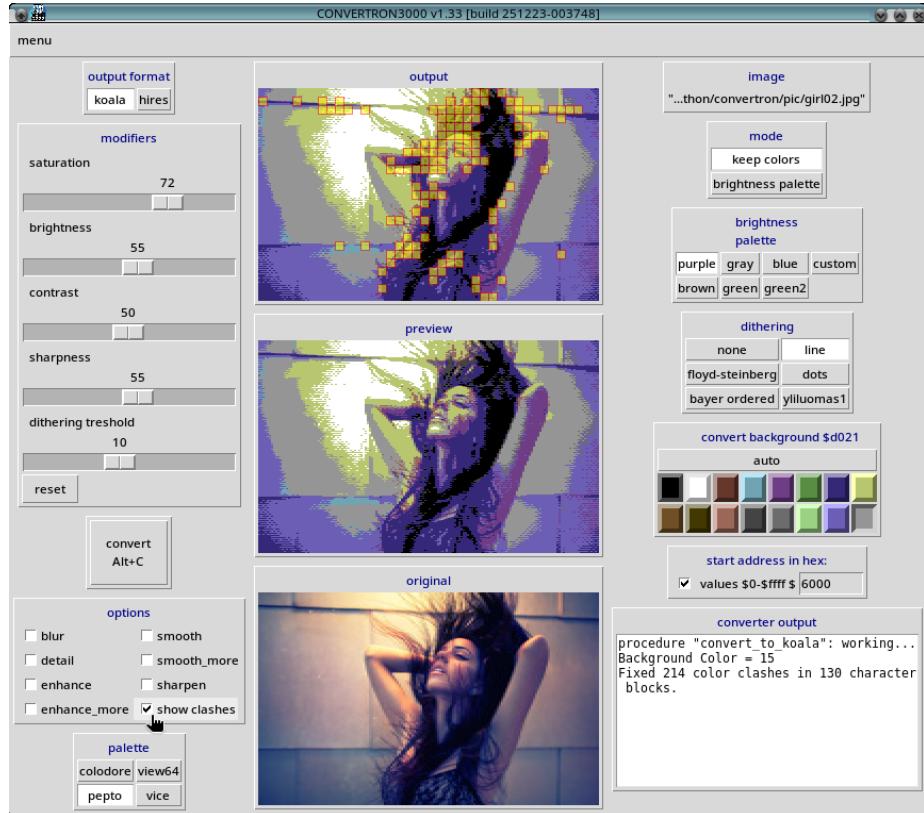


Figure 1: screenshot

## Why Convertron3000?

reason	description
open source	easy to modify and to improve, any useful contribution is highly welcome
portable	available on Linux, MacOS, Windows and any other system supported by Python3

reason	description
instant preview	just fiddle around with the sliders and see the result before converting
deal with color clashes	visualize color clashes instantly or read out their position from an optional json-file

## Usage

Using Convertron3000 is pretty straight-forward:

- Open some image.
- Adjust the sliders or apply an effect.
- Convert to koala or hires format.
- optional: Check position of color-clashes.
- Save the resulting image.

## Commandline options

```
CONVERTRON3000 v1.33 [build 250322-030736] *** by fieserWolf
usage: convertron.py [-h] [-i INPUT_IMAGE] [-c CLASHES_JSON] [-o CLASHES_IMAGE] [-d]
```

This program reads an image-file, lets the user adjust settings and converts it to a C64 koa

options:

```
-h, --help            show this help message and exit
-i, --image INPUT_IMAGE
                      image file)
-c, --clashes CLASHES_JSON
                      filename of report containing all color-clashes (in json-format (def
-o, --output CLASHES_IMAGE
                      filename of color-clash image (default="/tmp/color_clashes.png")
-d, --debug           show color-clashes on console
```

Example: ./convertron.py -i image.png -c /tmp/clashes.json -d

## Dithering

As of now, Convertron3000 offers various dithering methods. As the PIL-library only implements “floyd-steinberg”-dithering, all other dithering methods were taken from the hitherdither library.

reason	description
floyd-steinberg dithering	speedy performance from the PIL-library
bayer-ordered dithering	the speedy standard, my favourite for C64 pictures
line dithering	a modified bayer-ordered dithering method, sometimes looks better than normal ordered dithering
dot dithering	not my favourite, but might give nice results on some pictures
yliliuomas1 dithering	Warning: Painfully slow - use with care! The results are stunningly good sometimes, though.

Please, take note that all dithering implementations except “floyd-steinberg”-dithering are quite slow when using the “Brightness palette”-mode, which is described below.

## Brightness palette

Sometimes converted images look better when applying a palette based on brightness values.

- Select “brightness palette” mode.
- Choose one of the presets (“purple”, “brown” etc.).

You can also create your own palette like this:

- Edit the .json file: In the .json file you specify the size of your palette and the C64-colors like in one of the examples provided.
- Open your .json file. You find this option in the drop-down menu under “open custom gradient”.
- Choose “custom” as your brightness palette.

## File Formats

The multicolor bitmap is stored in the widely-spread KoalaPainter (.koa) format:

- 2 bytes load address
- 8000 bytes raw bitmap data
- 1000 bytes raw “Video Matrix” (screen) data
- 1000 bytes raw “Color RAM” data
- 1 byte background data

The hires bitmap is stored in the widely-spread Advanced Art Studio (.art) format:

- 2 bytes load address
- 8000 bytes raw bitmap data
- 1000 bytes raw “Video Matrix” (screen) data

## Authors

- fieserWolf/Abyss-Connection - *initial work* - <https://github.com/fieserWolf> <https://csdb.dk/scener/?id=3623>

### Acknowledgments

- thanks to Green/ATW for spontaneously naming Convertron3000 :)
- thanks to people on csdb.dk for commenting and giving ideas how to improve
- thanks to Henrik Blidh for his hitherdither library <https://github.com/hbldh/hitherdither> which I use

# Getting Started

Convertron3000 comes in two flavors:

- standalone executable for 64-bit systems Linux, MacOS/Darwin and Windows (see releases)
- Python3 script

## Run the standalone executable

Just download your bundle at releases and enjoy. Keep in mind that only 64bit systems are supported as I could not find a 32bit system to generate the bundle.

### Note for Windows users

If some antivirus scanner puts Convertron3000 into quarantine because it suspects a trojan or virus, simply put it out there again. It isn't harmful, I used PyInstaller to bundle the standalone executable for you. Unfortunately, the PyInstaller bootloader triggers a false alarm on some systems. I even tried my best and re-compiled the PyInstaller bootloader so that this should not happen anymore. Keep your fingers crossed ;)

### Note for MacOs users

Your system might complain that the code is not signed by a certificated developer. Well, I am not, so I signed the program on my own.

"Convertron3000" can't be opened because it is from an unidentified developer.

You need to right-click or Control-click the app and select "Open".

## Run the Python3 script directly

Download *convertron.py* and the whole *resource* - directory into the same folder on your computer.

### Prerequisites

At least this is needed to run the script directly:

- python 3
- python tkinter module
- python "The Python Imaging Library" (PIL)
- python "argparse" library
- python "hitherdither" library

Normally, you would use pip like this:

```
pip3 install tk pillow argparse git+https://www.github.com/hbldh/hitherdither
```

On my Debian GNU/Linux machine I use apt-get to install everything needed:

```
apt update  
apt install python3 python3-tk python3-pil python3-pil.imagetk  
pip3 install git+https://www.github.com/hbldh/hitherdither
```

# **Changelog**

## **Future plans**

- custom brightness palette editor

Any help and support in any form is highly appreciated.

If you have a feature request, a bug report or if you want to offer help, please, contact me:

<http://csdb.dk/scener/?id=3623> or [wolf@abyss-connection.de](mailto:wolf@abyss-connection.de)

## **Changes in 1.34**

(next release candidate)

- bug fix: proper file-not-found handling when opening images
- bug fix: fixed crash when not finding reasonable color replacement in hires mode (thanks slesinger)

## **Changes in 1.33**

- added: color-clashes can be saved as image and as json
- bug fixes

## **Changes in 1.32**

- added proper commandline argument parsing (try “convertron.py –help”)
- added json output of color clashes (can be read from other tools to work on color clashes)
- fixed: removed leftover saving debug image “/tmp/1.png”

## **Changes in 1.31**

- fixed: wrong hires image dimensions when using line dithering

## **Changes in 1.3 (on X2024)**

- fixed: proper scaling, better conversion
- show position of color clashes in GUI and on console

## **Changes in 1.2**

- proper dithering support: bayer-ordered, line dither and some others
- GUI improvements
- moved standalone executables to releases

## **Changes in 1.1**

- transferred whole code to Python3
- great speed improvement, converts much faster now
- new feature: specify image on the command-line, e.g. “convertron.py picture.jpg”
- standalone executables for 64bit-systems: Linux, Darwin (MacOS) and Windows
- GUI design adjusted for MacOS/Darwin
- numpy library not used any more
- documentation
- custom brightness palette now uses .json format

## **Changes in 1.01**

- added licenses
- added to github with proper README.md

## **Changes in 1.0**

- hires mode
- colodore palette
- button: reset color modifiers to default
- start address now in hex
- custom brightness palette (config file)

## **Changes in 0.1**

- initial release

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For further questions, please contact me at <http://csdb.dk/scener/?id=3623> or [wolf@abyss-connection.de](mailto:wolf@abyss-connection.de)

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## **hitherdither-library**

<https://github.com/hbldh/hitherdither> library used

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## **argparse**

<https://github.com/bewest/argparse> library used

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## **History**

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