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# Convertron3000

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

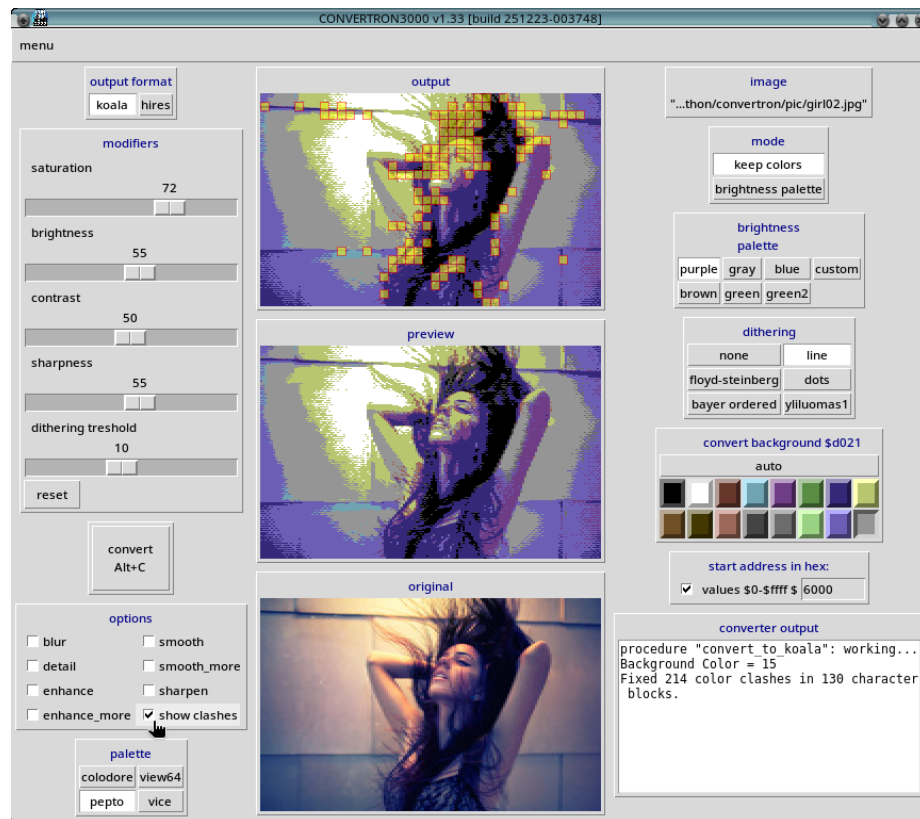


Figure 1: screenshot

## 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
instant preview	just fiddle around with the sliders and see the result before converting

reason	description
deal with color clashes	visualize color clashes instantly or read out their position from an optional json-file

## Author

- 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

## Using Convertron 3000

### 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.

### shortcuts

key	function
F1	help
Alt-o	open image
Alt-s	save image (koala or hires format)
Alt-c	convert image
Alt-p	open settings
Alt-v	save settings
Alt-q	quit

### 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
yliluomas1 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

## Commandline options

```
CONVERTRON3000 v1.34 [build 251225-195551] *** by fieserWolf
usage: convertron.py [-h] [-i INPUT_IMAGE] [-g FILE_GRADIENT] [-s FILE_SETTINGS] [-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)
-g, --gradient FILE_GRADIENT
                           filename of custom gradient file (JSON) to be loaded
```

-s, --settings FILE\_SETTINGS  
                                  filename of settings file (JSON) to be loaded  
-d, --debug                      show color-clashes on console

Example: ./convertron.py -i image.png -g 8color\_gradient-brown.json -s settings.json -d

## Getting Started

Convertron3000 comes in two flavors:

- Python3 script if you have python3 installed on your system (preferred method)
- executable for Linux and Windows (see releases)

### Run the executable

Just download your zip-bundle at releases, extract it to a folder of your choice and enjoy.

#### 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

In releases you also find older versions of Convertron 3000 compiled as standalone executables. You may use this, but 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 (on Dream210 Party 2025)

(next release candidate)

- all settings can now be written to a file and restored to a file (json format)
- rearranged the main layout to simplify the workflow (all controls are closer by now)
- rewritten the whole code, split up into parts
- rearranged the documentation
- responsive GUI
- 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 for the bug report)

## 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 “converttron.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

- transfered 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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