



Thank you for purchasing the rot13labs h4ckb0ard! There's plenty about this keyboard that is left for users to discover on their own, but this document contains everything you need to know to get started.

### Hardware:

The h4ckb0ard was designed, as its name implies, to be hacked and tinkered with. It uses mill-max hot-swap sockets to ensure flexibility in the layout, but also to allow the switches to be swapped and replaced constantly without wearing out over time. The h4ckb0ard was built entirely out of PCBs and designed to be easily be taken apart and reassembled using only basic tools.

On the main board, around the ATmega328p MCU, there are small pads to easily access VCC and GND as well as the reset and boot pins on the MCU itself. Around this same area is an AVR ISP port using a 10-pin plug of nails. If desired, this port can be used to flash a new boot loader onto the ATmega328p.

If the boot loader is adjusted, and you ever want or need to return it to its original state, the original backboard boot loader (a modified version of the USBASPLoader) can be downloaded from the h4ckb0ard repo at <https://github.com/c0ldbru/h4ckb0ard>

The h4ckb0ards hardware is fully open source. If you wish to download the gerber files they can be downloaded from the h4ckb0ard repo at <https://github.com/c0ldbru/h4ckb0ard> Please feel free to use, modify, or redistribute these as you see fit so long as c0ldbru / rot13labs is still credited as the original creator.

### Firmware:

The h4ckb0ard is fully QMK compatible, which means the firmware can be easily adjusted or replaced over USB using the QMK toolbox which can be downloaded at: [https://github.com/qmk/qmk\\_toolbox](https://github.com/qmk/qmk_toolbox) The h4ckb0ard uses the ATmega328p MCU, so that will need to be selected in the QMK toolbox when flashing new firmware onto it.

New firmware can be customized from scratch or from rot13labs templates using the rot13labs h4ckb0ard keyboard directory in the QMK project repo or by using the QMK configurator at <https://config.qmk.fm> (PR pending as of the time of writing this document) Please note that replacing the firmware will remove all hidden puzzles from the h4ckb0ard, however the original firmware can be downloaded <https://github.com/c0ldb0ru/h4ckb0ard> to restore them at any time.

When you have new firmware and are ready to flash it onto your h4ckb0ard, unplug it from your machine and open QMK toolbox. Set the MCU drop-down to ATmega328p, then click "open" and select the firmware you wish to flash onto the h4ckb0ard. Once QMK toolbox is ready, while holding down the ESC key on your h4ckb0ard, plug it in. Continue holding the ESC key for a few seconds and you will see it show up in QMK as a USBASP device. Hit "Flash" and wait for QMK to show "Flash Complete." Once you see this message, you can safely unplug your backboard and plug it back in. It should now show back up as "rot13labs h4ckb0ard" and be usable with the new firmware you have installed.

Updated firmware may be released periodically. If a new firmware is released it will be placed into the h4ckb0ard repo along with an MD5 hash to validate.

## Layers:

The default h4ckb0ard firmware has almost 20 layers of functionality, however most of those will need to be discovered by the user through tinkering or by finding clues on the h4ckb0ard itself. The 4 main layers can be easily swapped to via the large hallow up arrow key on the far right. These layers are as follows:

0. Letters. The first layer is exactly as the keys show; the main letters on the keyboard

1. Symbols & Audio Controls. This layer can be accessed temporarily by holding the FN key while on layer 0 and shifts the right side of the h4ckb0ard over into the symbols that would be to the right of those letters. the minus and equal sign keys are accessed via Q and W as there is no number row. This layer also offers basic audio controls with up and down controlling volume and right and left controlling next track and previous track.

2. Numbers. The third layer can be accessed momentarily by holding the ALT key while on layer 0. It shifts the number row down onto the switches in the QWERTY row, allowing the user to type numbers or their shifted symbols.

3. RGB Controls. The final layer that can be accessed via the large hallow layer up key is the RGB control layer. On this layer, O and P will shift to the next or previous RGB animation pattern, L will toggle RGB on or off, up and down will increase or decrease the brightness, left and right will adjust the hue, U and J will increase or decrease the saturation, and finally I and K will increase or decrease the speed of the RGB animation.

Please note that for any and all other (hidden) layers, hitting ESC or the large hallow layer up key will immediately return the user to layer 0, restoring its original functionality regardless of how deep into the h4ckb0ard layers you currently are.