Quadrant E-C 5x14 ortholinear keyboard

The barebone kit

The kit includes the following:

- 1pc top PCB (it supports MX style, PCB mount switches, Kailh Choc V1 low profile and Alps switches)
- 1pc switch plate
- 1pc bottom PCB
- 70pcs 1N4148 THT diodes
- 1pc 3mm LED (cool white)
- 1pc 1k Ohm resistor for LED
- 1pc 6x6mm tactile push button
- 10pcs M2x6mm standoffs
- 4pcs M2x10mm standoffs
- 12pcs M2x4mm screws
- 4pcs M2x6mm screws
- 4pcs M2x12mm screws
- 1pc transparent polycarbonate shield
- 4pcs rubber feet

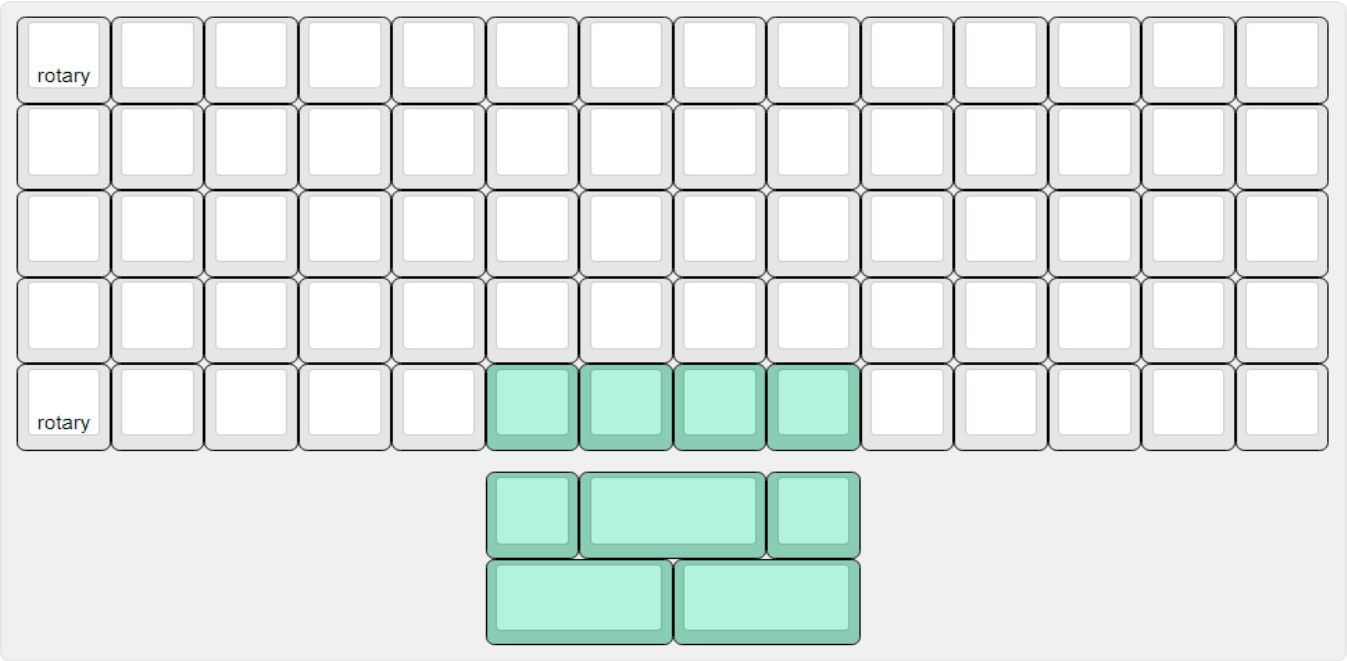
The case kit

The kit includes the following:

- 1pc top PCB (it supports MX style, PCB mount switches, Kailh Choc V1 low profile and Alps switches)
- 70pcs 1N4148 THT diodes
- 1pc 3mm LED (cool white)
- 1pc 1k Ohm resistor for LED
- 1pc 6x6mm tactile push button
- 6pcs M2x15mm standoffs
- 2pcs M2x6mm standoffs
- 16pcs M2x6mm screws
- 10pcs case parts
- 6pcs rubber feet

Layout options

v1.3



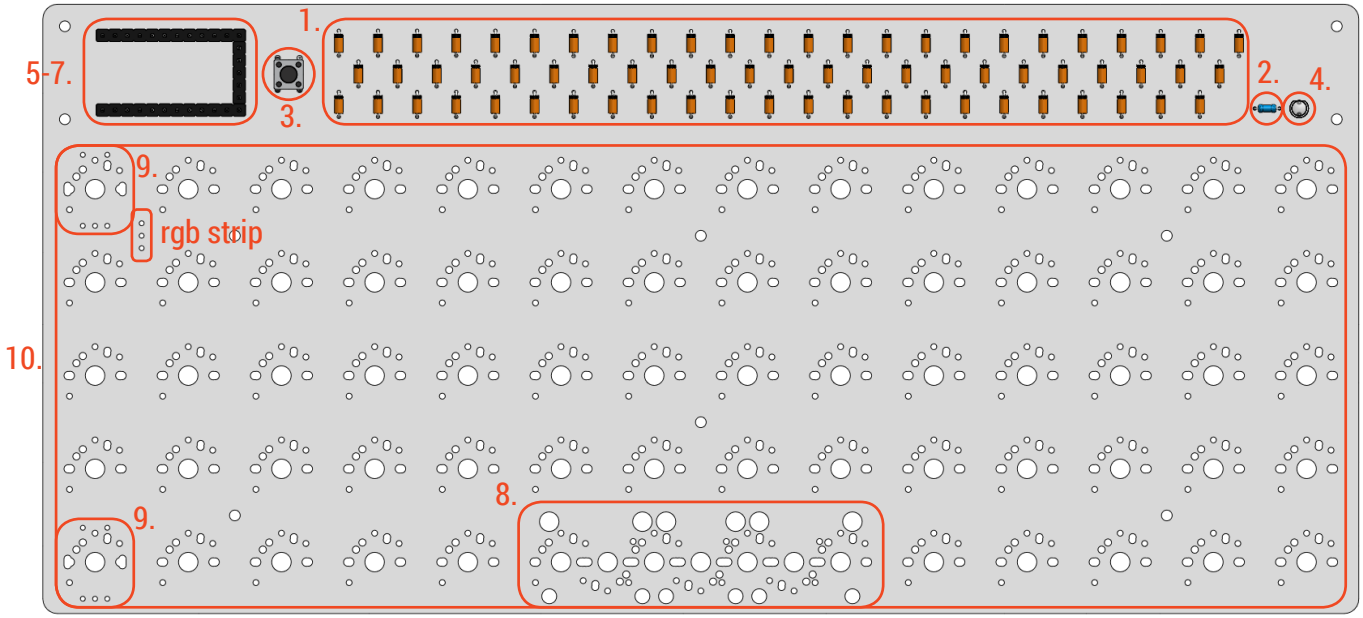
Build Guide

Parts needed to build the top PCB:

- 1pc Elite-C microcontroller
- 67-70pcs switches (MX-compatible / Kailh Choc V1 / Alps-style switches)
- 1 pc EC11 rotary encoder (optional)
- 1 or 2pcs 2u PCB mount MX stabilizers if using 2u keys
- 1pc USB-C - USB-A cable

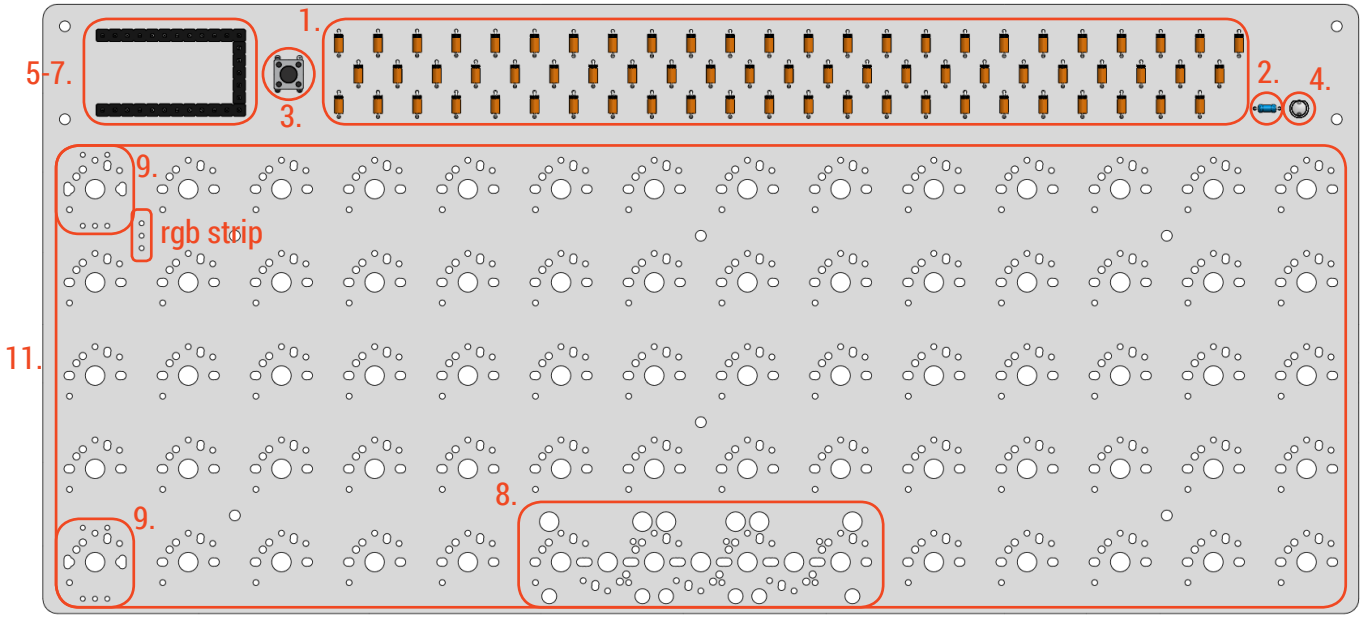
Build steps - barebone kit:

1. Solder diodes on the top PCB (*D1-D70*). Caution: orientation of the diodes is matter, so position the diodes as the black half of them point to the upper edge of the PCB!
2. Solder resistor (*R1*; orientation doesn't matter)
3. Solder push button (*SW1*; orientation doesn't matter)
4. Solder LED (*LED1*; the longer leg of LED is the anode, so position the LED as the flat side points to the upper edge of the PCB)
5. Solder pin headers for Elite-C *(U1)*
6. Flash Elite-C via QMK
7. Solder Elite-C on the PCB *(U1)*
8. Add 2u stabilizers (optional)
9. Solder rotary encoder (*ROT1* **or** *ROT2*; optional)
10. Snap the switches into the switch plate them solder them according to your preferred layout (MX1-MX73)



Build steps - case kit:

1. Solder diodes on the top PCB (*D1-D70*). Caution: orientation of the diodes is matter, so position the diodes as the black half of them point to the upper edge of the PCB!
2. Solder resistor (*R1*; orientation doesn't matter)
3. Solder push button (*SW1*; orientation doesn't matter)
4. Solder LED (*LED1*; the longer leg of LED is the anode, so position the LED as the flat side points to the upper edge of the PCB)
5. Solder pin headers for Elite-C *(U1)*
6. Flash Elite-C via QMK (see instructions in the Firmware chapter)
7. Solder Elite-C on the PCB *(U1)*
8. Add 2u stabilizers (optional)
9. Solder rotary encoder (*ROT1* **or** *ROT2*; optional)
10. Place the 2 mm *layer_D2* transparent acrylic sheet (spacer between the *layer_D1* switch plate and the PCB) on the top of the PCB aligned to the switches holes
11. Insert the switches into the 3mm *layer_D1* switch plate then solder them according to your preferred layout (MX1-MX73)



Using WS2812B LED strip:

You will need a WS2812B LED strip and 3 pcs of AWG18 or similar cable to connect the LED strip(s) to the three pin on back side of the top PCB *(rgb strip)*. To make it work you have to enable the RGBLIGHT option in QMK files and configure the lighting setup in *config.h* according to your LED strip (number of LEDs, lighting steps, modes, etc.) More information about this feature on QMK's page: https://beta.docs.qmk.fm/features/feature_rgblight

Firmware

First of all: you need to choose using QMK or VIA.

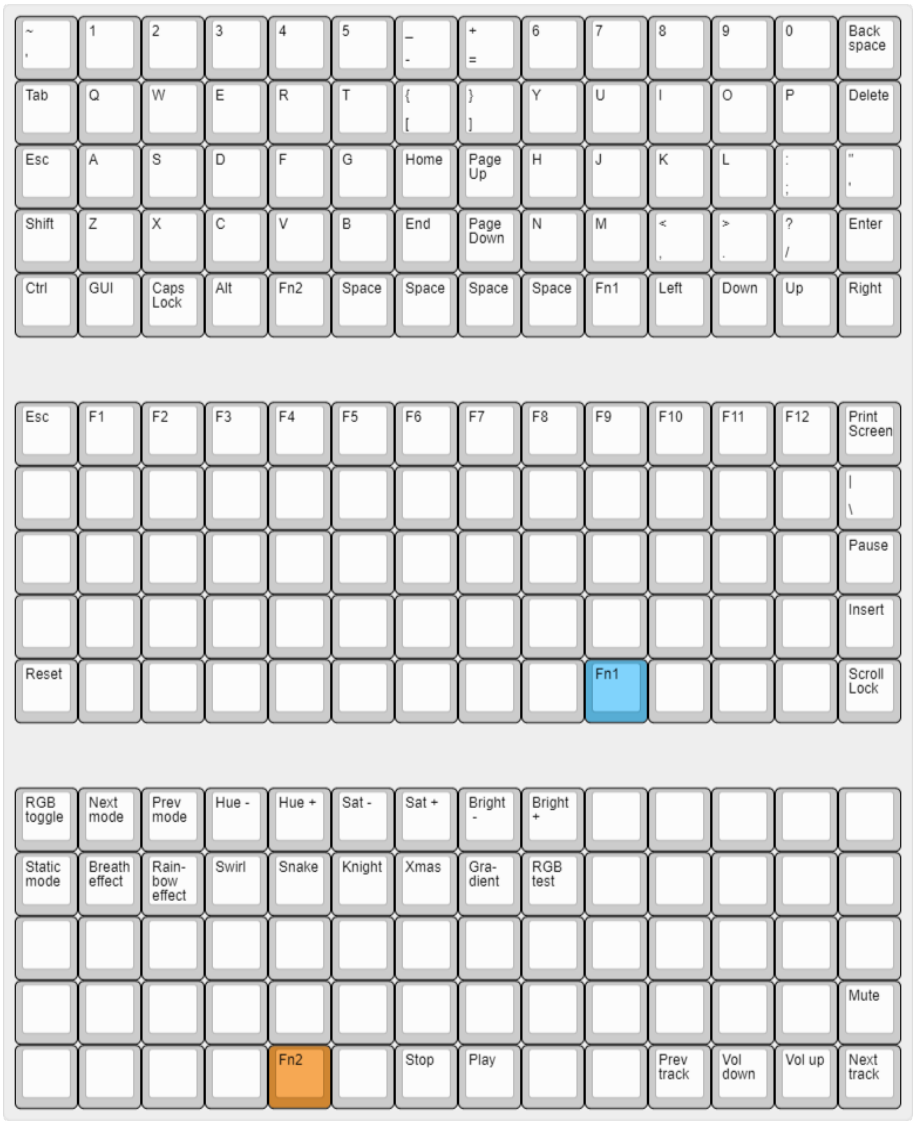
QMK

If you don't have the appropriate QMK environment already, please follow the guidelines of this official tutorial: https://beta.docs.qmk.fm/newbs/newbs_getting_started

1. If you would like to change the layout or the keymap of your Quadrant, open the files in the folder with a code editor (i.e. Visual Studio Code):
   1.1. You can choose one of the 5 layout options, which is identical to the physical layout of your build:
      2.1.1. *LAYOUT_ortho_5x14*: full grid layout;
      2.1.2. *LAYOUT_ortho_5x14_1x2uC*: one 2u key in the middle of the bottom row (similar to Planck MIT layout);
      2.1.3. *LAYOUT_ortho_5x14_1x2uL*: one 2u key arranged asymmetrically in the middle of the bottom row (left);
      2.1.4. *LAYOUT_ortho_5x14_1x2uR*: one 2u key arranged asymmetrically in the middle of the bottom row (right);
      2.1.5. *LAYOUT_ortho_5x14_2x2u*: two 2u keys in the middle of the bottom row.

   The template matrices are found in the *quadrant.h* file.

   1.2. You can modify the keys of your layout of choice in the *keymap.c* file. The default keymap with 2 function layers:



1.3. For RGB backlight, you can configure the RGB settings in the *config.c* file. More information on QMK's RGB tutorial: https://beta.docs.qmk.fm/features/feature_rgblight
1.4. The settings of the rotary encoder can be find in the *quadrant.c* file.
1.5. Save the files.
2. Compile the code: *make ealdin/quadrant:default*
3. Plug the Elite-C microcontroller into your PC.
4. Flash it via QMK Toolbox (https://qmk.fm/toolbox/), using the newly created *.hex* file.
5. Unplug and solder the Elite-C on your Quadrant.

For further informations, please check out QMK's Newbs Guide: https://beta.docs.qmk.fm/newbs

VIA

VIA is a flexible and easy application, which helps you swapping the keys of your keyboard on the fly - you don't have to flash you firmware everytime you would like to change some keycodes! But take that into consideration: it doesn't support rotary encoders yet.

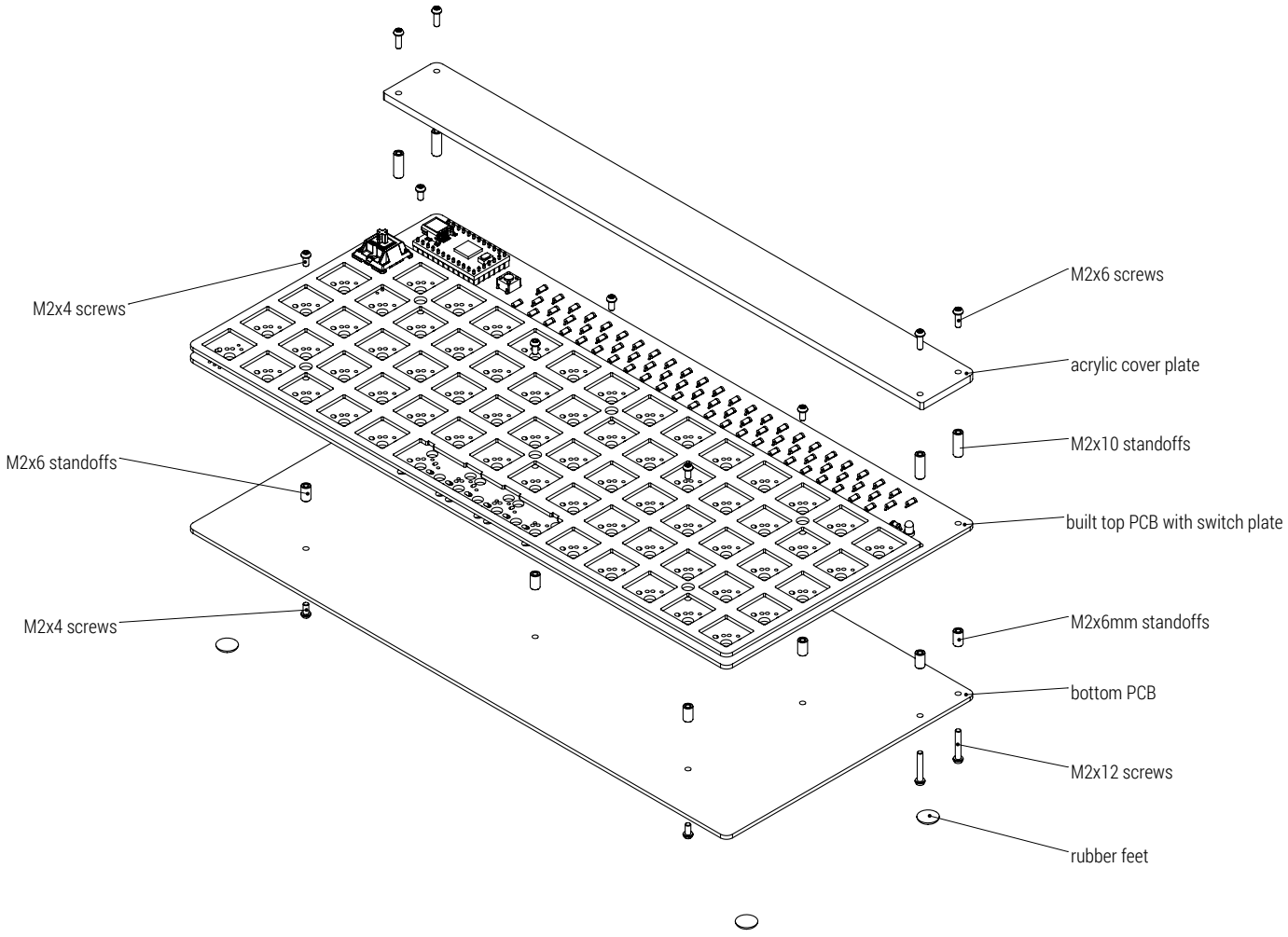
1. Download VIA desktop app from its official website: https://caniusevia.com/
2. Download VIA json file from Quadrant's Github page: https://github.com/Ealdin/keyboards/tree/master/Quadrant/firmware/quadrant/via
3. Compile the code: *make ealdin/quadrant:via*
4. Plug the Elite-C microcontroller into your PC.
5. Flash it via QMK Toolbox (https://qmk.fm/toolbox/), using the newly created *.hex* file.
6. Unplug and solder the Elite-C on your Quadrant.
7. Start the VIA desktop app and import the json keymap (Ctrl+O shortcut).
8. Plug in your Quadrant and the app will recognize your keyboard.
9. You can choose between the layout option in the *Layouts* menu.
10. You can modify the RGB lighting in the *Lighting* menu.

Assembling the keyboard

You will need a hex screwdriver with a 1.5mm bit for M2x4 and M2x12 screws and a T5 torx bit for M2x6 screws.

The barebone kit:

1. Screw together 6 M2x4 screws, all 4 pcs of M2x12 screws and all of the M2x6mm standoffs, while the bottom PCB is sandwiched between them.
2. Place the built top PCB on the top of the standoffs and the M2x12 screws. Align the screw holes of the standoffs with the holes of the top PCB.
3. Use the remained 6 pcs of M2x4 screws to fasten the top PCB to the standoffs.
4. Screw on the 4 M2x10mm standoffs to the M2x12 screws.
5. Place the polycarbonate shield on the top of the M2x10mm standoffs and align the holes with the standoffs.
6. Fasten the shield with the 4 M2x6 screws to the standoffs.
7. Put the rubber feet on the bottom of the keyboard.
8. Put on some fancy keycaps.
9. Plug in a USB-C cable.
10. Enjoy your Quadrant!



The case kit:

1. Screw the long plates (*layer_F, H, I and J*) together with *layer_G* using M2x6 srcews and brass standoffs - it will be the bottom of the case.
2. Lay the plates on top of each other in the following order: *bottom of the case -> layer_F -> layer_E -> assembled top PCB built with layer_D1 and D2 -> layer_C -> layer_B -> layer_A (transparent sheet)*
3. Use the remained 6 pcs of M2x4 screws to fasten the top PCB to the standoffs.
4. Screw on the 4 M2x10mm standoffs to the M2x12 screws.
5. Assemble them together using the M2x6 screws and M2x15 standoffs. An tip: screw the M2x15 standoffs to the *bottom of the case* (*layer_G*) and then attach the other layers to the standoffs.
6. Fasten the *layer_A* with the 6 M2x6 screws to the standoffs.
7. Apply the rubber feet on the bottom of the keyboard.
8. Put on some fancy keycaps.
9. Plug in a USB-C cable.
10. Enjoy your Quadrant!