

# CUSTOM MECHANICAL KEYBOARD INFOGRAPHIC

Version 2.0

Latest version available at  
superanked.com/custom-mechanical-keyboard-infographic

Resources:  
reddit.com/r/MechanicalKeyboards, cherry.mx.de

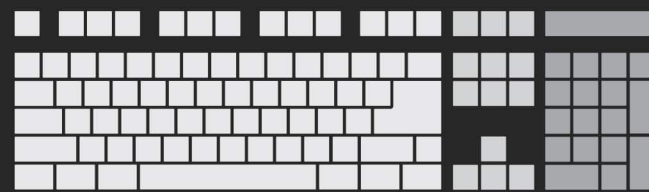
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SupеRanked



## 1 Keyboard

### 1.1 Main types of keyboard

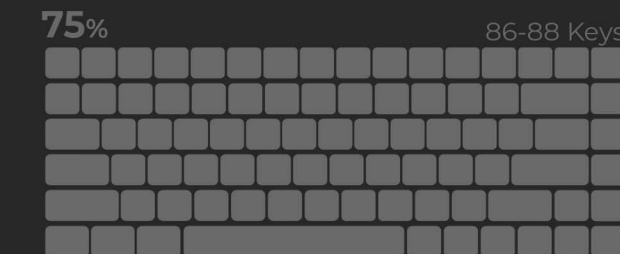


Full Size

Tenkeyless (TKL)

Compact

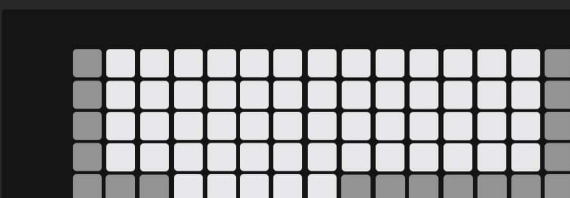
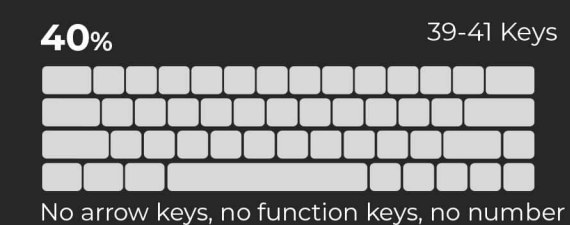
### 1.2 Compact keyboards



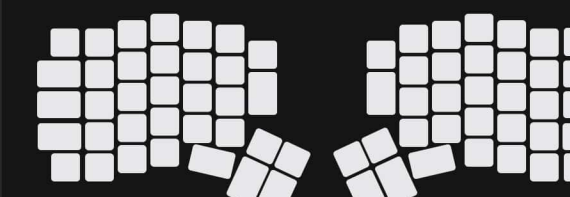
65%  
66-68 Keys



40%  
39-41 Keys



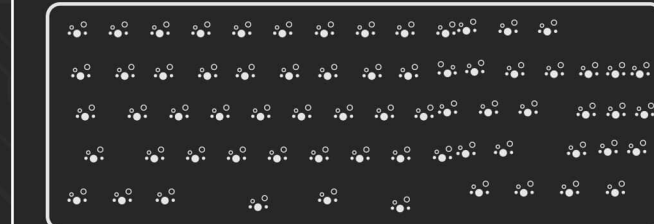
Ortho  
The rows are straight and in line with each other, freedom of functionality/programmability.



Split  
Separated in 2 modules, with different shapes and layouts.

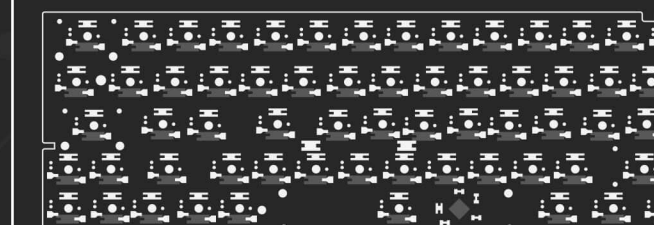
## 2 PCB & Plate

### 2.1 PCB



#### Regular PCB

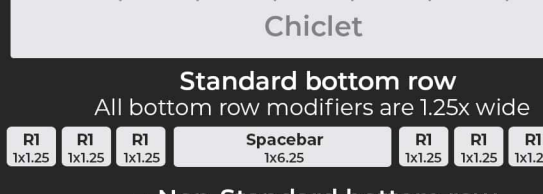
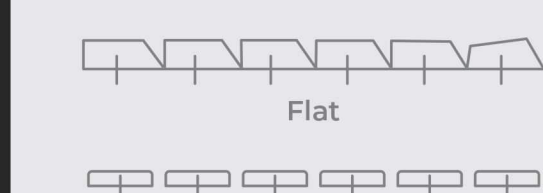
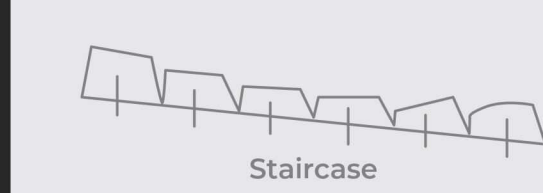
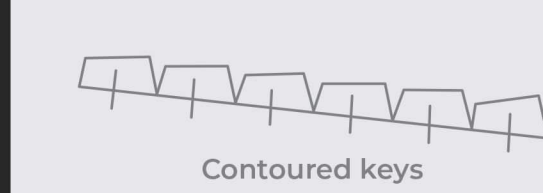
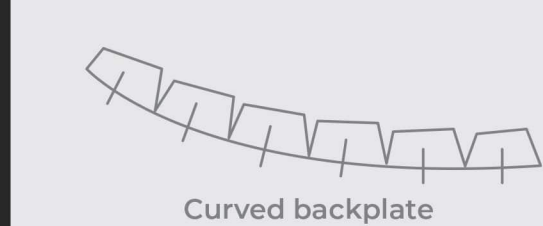
With multiple solder points (plated through-holes) to accommodate alternate layouts.



#### Hot swap PCB

It allows to swap out the switch without having to solder or desolder anything.

### 1.3 Keyboard angle



### 2.2 Hard plate vs Soft plate

The main factor affecting typing feel is how hard the plate is during bottom out.

#### Stiff

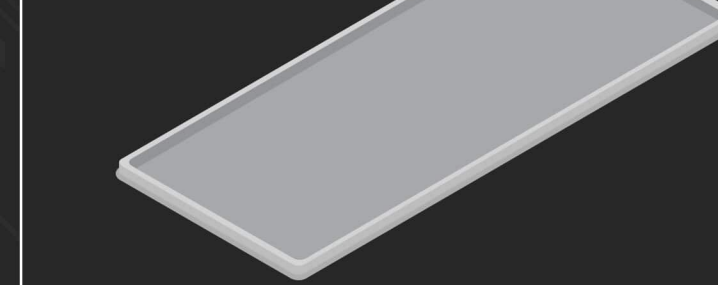
- Steel
- Brass
- Aluminium
- Carbon fibre
- FR4

#### Flex

- Plastics (ABS, acrylic, polycarbonate)
- Plateless

## 3 Case

### 3.1 Case options



#### Most common materials are:

- Aluminum
- Plastic
- Wood
- Clear Acrylic

#### Two Piece construction

Such a kit consists of a case and a PCB/Plate combo. PCB and plate are only counted as ONE piece since the plate is potentially optional.

#### Three Piece construction

On top of the Two Piece construction content (Bottom case, PCB/Plate), these kits usually include a top frame for the case. The frame is commonly held in place by screws through the bottom case.

### 1.4 Modifiers compatibility

Finding keycaps for a non-standard bottom row requires an accurate selection of the combinations of PCB, Plate and Keycaps. Here's an example to tell whether the bottom row is standard or non-standard.

## 4 Switches

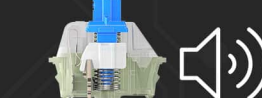
### 4.1 Types of switch



**Linear switches:** they move straight up and down without any tactile feedback or clicking noise. Rapid actuation, suitable for gamers.



**Tactile switches:** they provide a noticeable bump in the middle of travel to let you know that your key press has been registered. Ideal for typing.



**Clicky switches:** they work the same way as tactile ones, but they offer a distinct "click" sound when the key is activated.

<b>Cherry MX Red</b> Linear Linear switching characteristics 45 cN operating force 2.0 mm pre travel 4.0 mm total travel No audible click	<b>Cherry MX Brown</b> Tactile and quiet Tactile switching characteristics 55 cN operating force 2.0 mm pre travel 4.0 mm total travel No audible click
<b>Cherry MX Black</b> Linear Linear switching characteristics 60 cN operating force 2.0 mm pre travel 4.0 mm total travel No audible click	<b>Cherry MX Blue</b> Tactile and clicky Tactile and audible switching characteristics 60 cN operating force 2.2 mm pre travel 4.0 mm total travel Audible click
<b>Cherry MX Silent Black</b> Forceful and silent Linear switching characteristics 60 cN operating force 1.9 mm pre travel 3.7 mm total travel No audible click	<b>Cherry MX Green</b> Tactile and audible switching characteristics 80 cN operating force 2.2 mm pre travel 4.0 mm total travel Audible click
<b>Cherry MX Clear</b> Tactile switching characteristics 65 cN operating force 2.0 mm pre travel 4.0 mm total travel No audible click	<b>Cherry MX Grey</b> Tactile switching characteristics 80 cN operating force 2.0 mm pre travel 4.0 mm total travel No audible click
<b>Cherry MX Silent Red</b> Soft and silent Linear switching characteristics 45 cN operating force 1.9 mm pre travel 3.7 mm total travel No audible click	

### 4.2 Switch structure



#### Upper housing

This component guides the switching slide precisely, forming the keyswitch's switching mechanism housing.

#### Stern

Creates the pre travel and the keystroke feel between the upper housing and coil spring.

#### Crosspoint contact

Also known as leaf, it is the heart of every keyswitch. It makes the electrical contact that activates the switch.

#### Coil spring

This is the part that sets up the pressure needed to activate the switch and the one that helps the switch moving back to original position.

#### Housing base

The inner part forms the mounting for the keyswitch's switching mechanism. The outer part is both the base and mounting surface for mechanical keyboards.

### 4.3 Cherry MX switches

### 4.4 Switch mount

#### Plate mounted

- The switch is mounted to a metal plate with the PCB under the plate.
- The switch does not have additional guide pins as the plate secures and aligns the switches.

#### PCB mounted

- The switch is mounted directly to PCB.
- The switch has additional guide pins to help align switch on PCB.
- You can easily modify a PCB mounted switch to fit on a plate mounted keyboard by removing the prongs cleanly with pliers, or a sharp razor.

### 4.6 Stabilizers

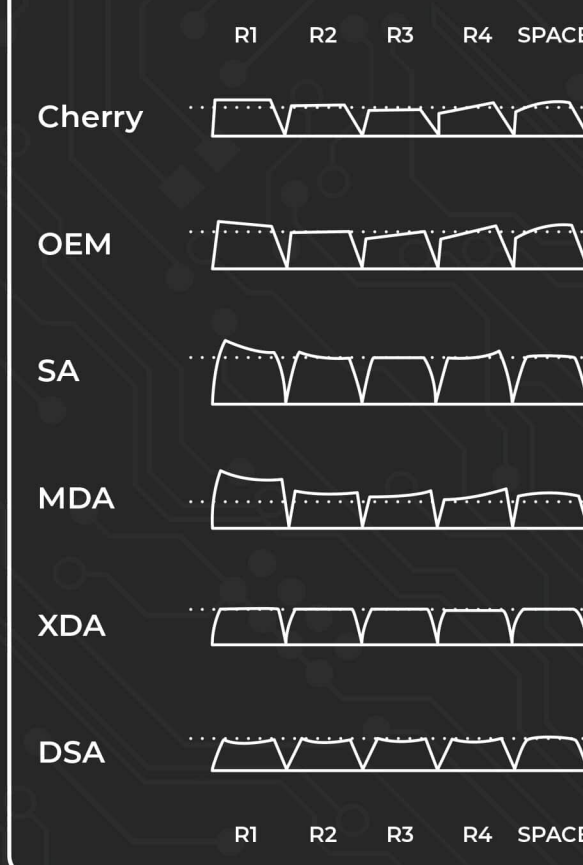
Stabilizers are for long keys such as the Spacebar, Shift, Enter, and Backspace. They allow the long keys to work reliably even when actuated from the extremities.

They come in two major types: Plate mount and PCB mount.



## 5 Keycaps

### 5.1 Keycaps profile



### 5.2 Keycaps materials

#### ABS

(Acrylonitrile Butadiene Styrene) plastic is a very common keycap material due to its low cost and ease of injection molding manufacturing. ABS is impact resistant, lightweight and durable. Uncoated ABS keycaps are prone to becoming shiny over time.

#### PBT

(Polybutylene Terephthalate) is less common due to higher cost. PBT keycaps have a more chalky feel and are also more resistant to key shine than ABS due to a higher abrasion resistance. Lastly, it is heavier in weight than ABS.

#### POM

(Polyoxymethylene, also known as Acetal) is even less common than PBT for keycaps due to a higher cost of manufacturing. These keycaps have similar properties to PBT with both resistance to shine and heavier weight per compared to ABS.

### 5.3 Keycaps printing

#### Double shot injection molding

This keycap type is produced when two layers of plastic are molded into each other. No printing necessary. The advantages are: markings cannot be worn off and the characters can achieve high contrast.

#### Dye sublimation

Process where heat is used to impregnate a material with a dye. This is different to printing in that printing forms a layer of paint on top of the plastic, whereas dye sublimation causes the dye to sink into the plastic. Dye sublimation requires that the dye must be darker than the material it is being used to dye.

#### Pad printing

One of the most popular form of keycap printing since the 1990s. Pads are dipped into ink, and then pressed onto the keycap to form a layer of ink on top of the keycap. This method is considered flexible (i.e. various colors) but the ink is prone to wear.

#### Screen printing with uv coat

Also called as silk screen printing. Letter of keyboard will be hollowed in a specially made woven mesh. When the paint is brushed, paint will filled the hollow parts and print letters on keycaps. It can also print various colors. To keep the letters from being scratched, uv coating will be added on top of letters.

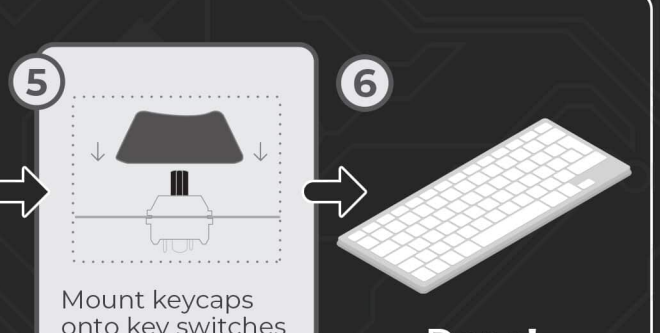
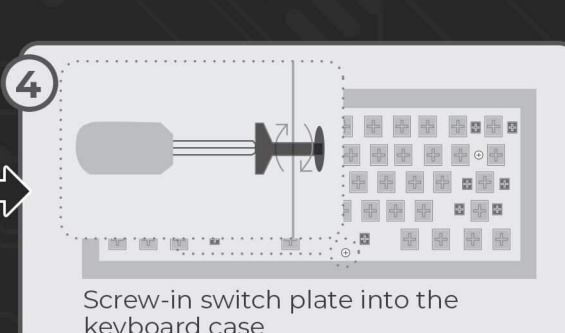
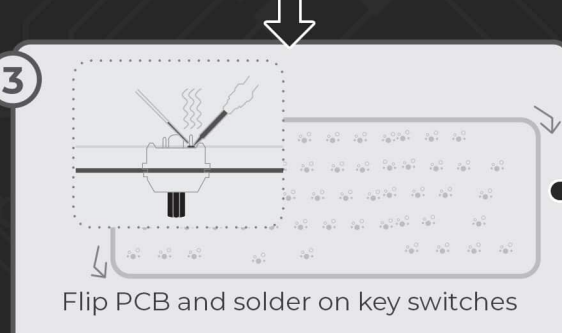
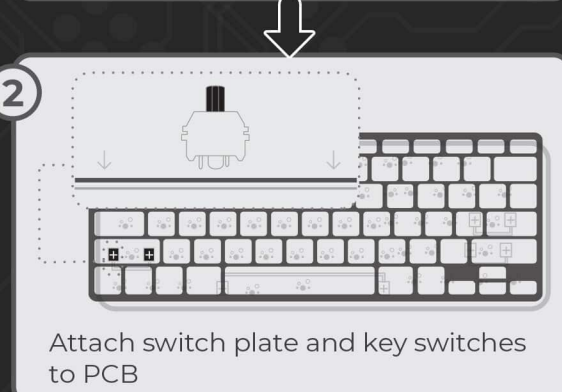
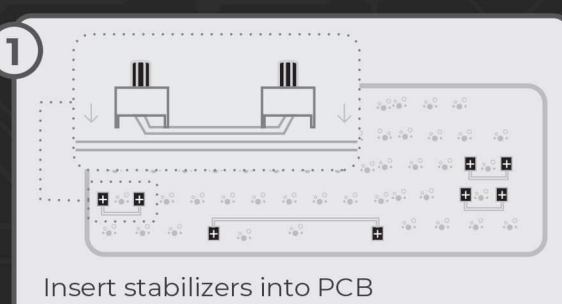
#### Laser engraving

Often used in the creation of transparent keys. The transparent plastic is covered in some coating, and a laser burns off the coating to expose the transparent plastic in the shape of the character.

#### Double shot injection molding

A laser is used to burn the required letters into the keycaps. This printing is mainly used for white keycaps, grey keycaps, or bamboo.

## 6 How-to build a mechanical keyboard



Done!