

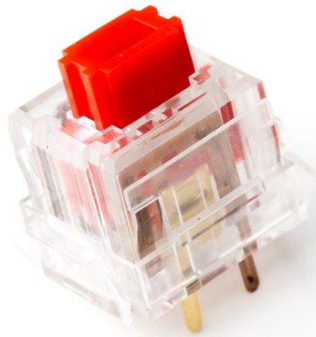
Quiet Linear Mechanical Keyboard Switch

A non-click, ultra-low activation force mechanical keyboard switch, for enthusiasts, by enthusiasts.

Hello, mechanical keyboard enthusiasts! We at the [Open Steno Project](#) are in the midst of creating from scratch [an entirely new keyboard for use by stenographers](#). Finding just the right key switch to meet our keyboard's exacting demands proved impossible, so we worked with one of the world's leading keyboard manufacturers to create a new key switch to our specifications.

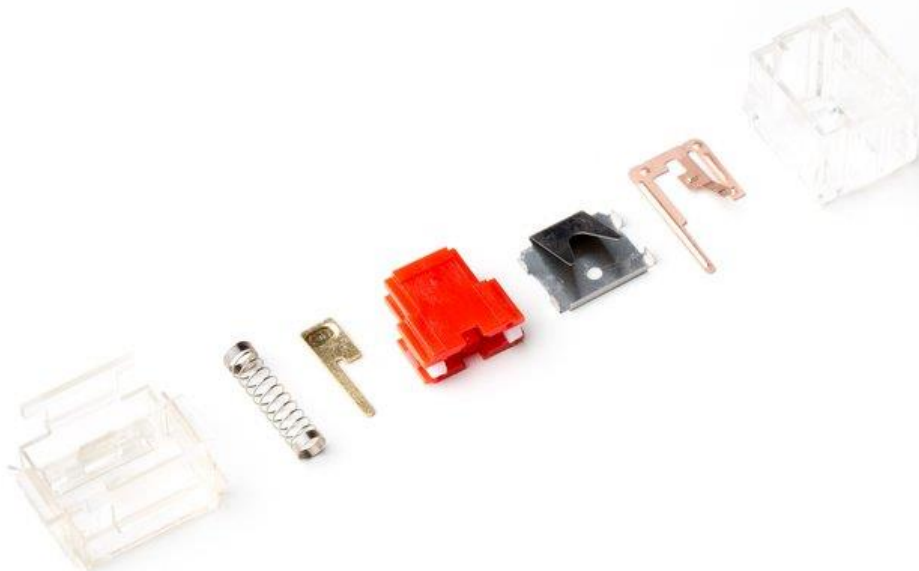


We're happy to offer these switches for the first time ahead of the production of our keyboard. In addition to being among the first people in the world to enjoy these key switches for your own projects, you can help support our cause - all proceeds go back into the development of an open source keyboard designed specifically to lower the cost of entry to the amazing world of stenography.



Hardware Specifications

- Action: linear, non-click
- Actuation force: 35 centi-Newtons
- Longevity: 50,000,000 cycles
- Key cap mount: Alps-style rectangular post
- Backlighting: from below through clear housing [\[example\]](#)
- Housing: standard Matias body [\[mechanical drawings\]](#)[\[3D model\]](#)
- Electrical contact: both sides gold-plated
- PCB layout: footprint already added to KiCad standard library [\[GitHub\]](#)



Key Features

Get it? *Key* features...

Non-click

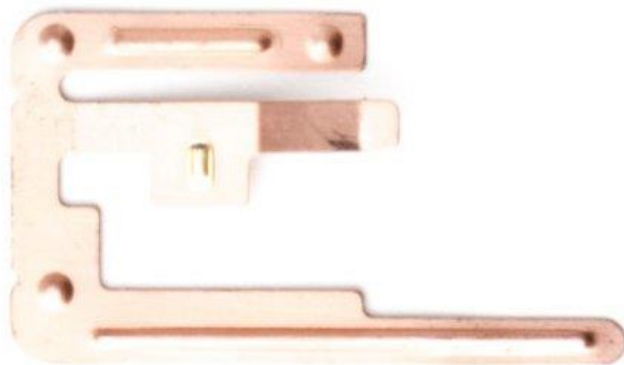
Our target users (stenographers) place an extreme emphasis on working with a quiet keyboard. After all, stenography often takes place right in the middle of free flowing conversation, such as in a courtroom or classroom, and the noise of rapid typing on a normal keyboard would be too distracting. Even the so-called “quiet click” keyboards are much too loud. Our key switch was specifically designed not to have any click mechanism.

Low Activation Force

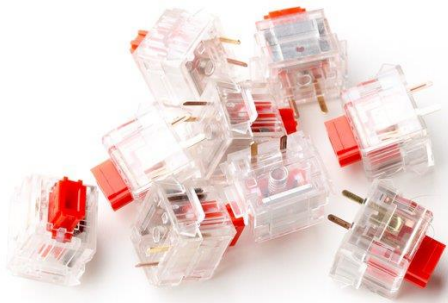
Stenographers often find themselves typing for many continuous hours. Every extra effort to depress a key quickly adds up and can lead to serious injury. Our key switch has, as far as we can tell, the lowest actuation force (35cN) of any mechanical key switch on the market. This is 22% less force than required by the nearest comparable switch, the Cherry MX Red.

Durable

We want our keyboard to last as long as anyone would want to use it, so our switches have to stand up to millions of strokes. At least 50 million to be precise. This is achieved by using high-quality, well-tested internal components.

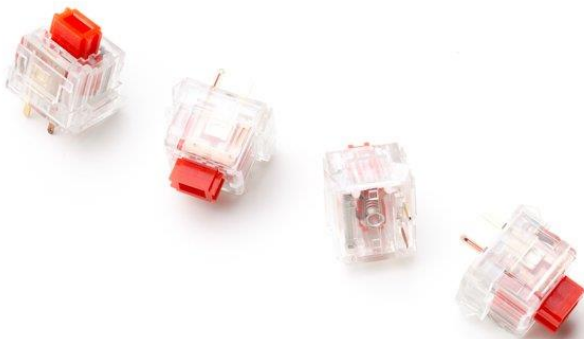


For example, consider the two electrical contacts in the switch. When the two contacts meet, an electrical connection is made and the key switch is considered to be "on." The standard way to make a great electrical connection is to cover the two contacts in gold. Indeed, one of the contacts in our switch is completely covered in gold. The other contact, pictured above, is gold-plated only on the small area that will actually physically touch the other contact. The reason for this is simply that the process of gold plating weakens the metal being plated, which would reduce the longevity of the key switch. The extra complexity of coating only a small portion of the contact in gold maintains the strength of the metal while at the same time providing just as good of an electrical connection.



Hackable

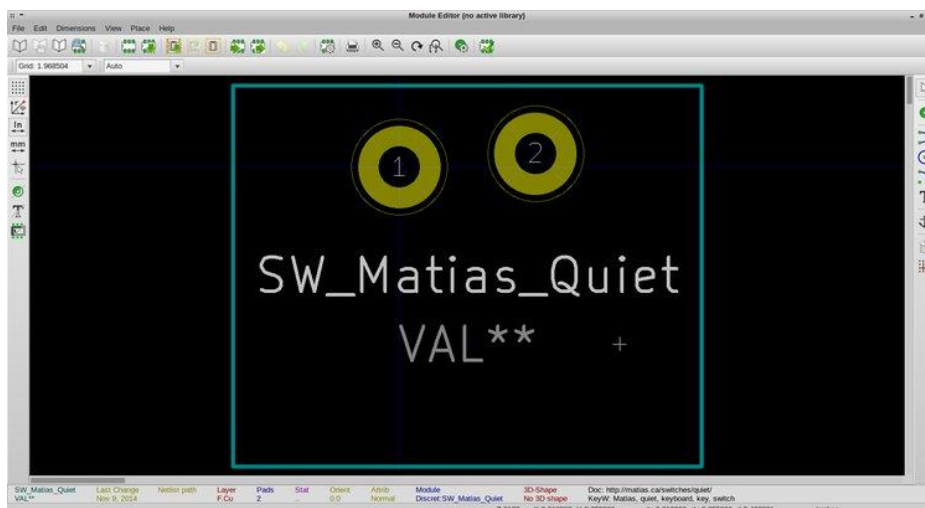
Our key switches can be completely disassembled and reassembled without using any tools, though tweezers help. This means that you can replace or modify any of the pieces. Of particular interest is the spring: you could replace or modify the spring to be more or less stiff to suit your exact touch. Even the color of the key switch can be modified - because the housing of our key switches is clear, they can be easily backlit without requiring a separate LED for each switch.



Critical for our keyboard is the requirement that custom key caps could be easily manufactured to fit onto the key switches. Unlike the Cherry MX line of key switches, which use a mounting post that requires a mating piece in the shape of a difficult-to-manufacture cross, our switches use an Alps-style mounting post that requires a simple rectangular mating piece. The practical upshot of this difference is that we can now create custom key caps by milling them out of metal, plastic, or other materials, without the need for injection mold tooling or lots of manual labor to modify existing key caps, both of which are expensive. The image below shows an example of some key caps we've made for our switches.



Finally, you can start using our key switches in your projects right away - we've already contributed a PCB footprint to the standard KiCad library of footprints, as shown in the screenshot below.



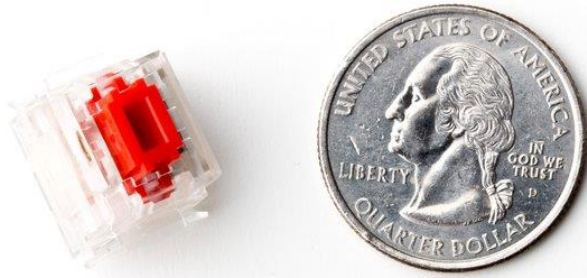
Inexpensive

One of the primary motivations of the keyboard for which these switches were designed is to make stenography financially accessible to a wide range of people. Keeping the cost of key switches down is a critical piece of this. As it turns out, the least expensive option that covers all of these features was for us to work with Matias to create our own switch.

Cherry MX Red Comparison

If you aren't a mechanical keyboard enthusiast, but want to learn more, check out [this guide to mechanical keyboards](#). If you are a mechanical keyboard enthusiast, you've probably heard of or even used the Cherry MX line of key switches. Here's how our key switch compares along the axes we most care about:

	Open Steno Project Key Switch	Cherry MX Red Key Switch
Durability	50,000,000 cycles	50,000,000 cycles
Actuation Force	35 cN	45 cN
Custom Key Caps	easy (rectangular mounting post)	difficult (cross mounting post)
Backlighting	easy (clear housing)	possible (clear housing on some models)
Availability	soon to be in regular production	out of common circulation
Price*		



Manufacturing

To create our switches, we worked directly with [Matias](#), a Canadian company with a long history of shipping great keyboards. Among other things, Matias is famous for reviving the Alps-style key switch used in the early Apple II mechanical keyboards. We prototyped and sampled several variations until we found the perfect fit. Matias handled all manufacturing. Matias has been a pleasure to work with and we've been lucky to find such an established partner willing to take on our relatively small project.

Crowdfunding Campaign Motivation

While the minimum order quantity (MOQ) for the initial batch of switches is much higher than the funding goal of this campaign (\$1,000) would suggest, we plan to use many of those switches to produce our own keyboard. We're running this campaign to simplify the logistics of offering our extra keys to other people. We look forward to seeing the projects that end up using them. Thanks for your support and enjoy these great key switches!