The Technical Description of the Leopold FC750R Mechanical Keyboard

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Outline of Contents

1 Introduction

Since written language was first perfected, humans wanted to record all that they could. Scribbling onto pieces of bark and then paper, the hands never seemed fast enough to write all that one wanted to record. That all changed in China around 868 A.D., when the first printing press was used to easily produce a Buddhist book named *The Diamond Sutra* (History.com 1). However, it was not until 1440 A.D. that Europe finally caught onto the printing trend with Johannes Guttenberg developing a commercial printing press using moveable type made of metal (History.com 2). With that, printing burst onto the scene and newspapers began to spring up all over Europe.

However even with fast and easy transcription from the use of printing presses, in the late 1800s, there were those looking to find a better way. In 1873, the first typewriter as would be recognized today was created by E. Remington and Sons, allowing people to press keys to quickly and easily type out neat sentences (Stamp 2). No more did man have to carefully arrange metal type blocks into guides as was the way of the printing press. However, when first developing the keyboard for the typewriter, E. Remington and Sons ran into some trouble. The keys kept getting stuck. Due to the way the type keys were attached, the typewriter would jam if adjacent keys were pressed in rapid succession. This made an alphabetical key layout (i.e. A-Z) very troublesome as many keys, such as S and T, which are often pressed directly after each other were adjacently placed (Lekashman 1). This eventually led to the development of the QWERTY keyboard, which is the same as the modern QWERTY keyboard with the period key and the R key switched. This effectively stopped the typewriter from jamming.

Finally, with the invention of computers and then personal computers in the 1970s, the need for an electronic keyboard for interacting with computers was born. IBM, the leading

computing company at the time, then created their Model M mechanical keyboard in 1984, which used a buckling spring mechanism to connect a circuit when fully pressed down to type each letter (Lekashman 3). This was the first mechanical keyboard and led to the start of the Internet age.

2 Description of Leopold FC750R Mechanical Keyboard

2.1 Outer Body (Back)

Composed of white matte plastic, the back of the outer body of the keyboard acts as the base and provides a stable and protective layer between the fragile internals of the keyboard and a desk. Six rubber rectangles, with groups of two stacked horizontal rectangles on each lower corner and one vertical rectangle on each top corner, give traction to the keyboard and stabilize it from shifting around on a smooth surface. On each of the top corners, a hinge mechanism attached to a short white matte plastic rectangle gives the top of the keyboard the ability to tilt towards the user, making for easier typing in a standing situation. The bottom of the outer body backing is slanted to allow the keyboard to rest flatly even in its tilted position.

Figure 1 : Backside of Outer Body

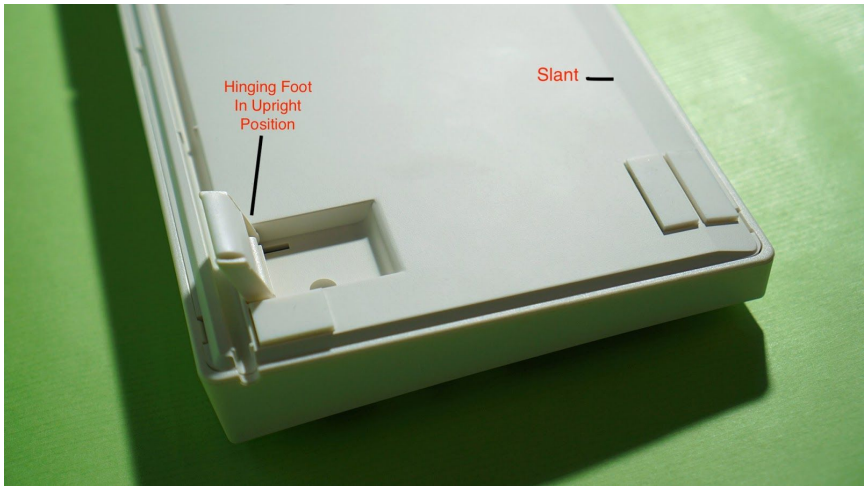

Figure 2 : Upright Back Foot

2.2 Outer Body (Front)

Also comprised of white matte plastic, the frontal outer body protects the innards of the keyboard (the pcb and switches) from foreign particles. With a cap-like build and cut-out spaces for each key, the outer body front keeps with the simplistic and neat-looking design intended for optimal efficiency.

Figure 3 : Front Outer Body Removed

Figure 4 : Naked Front of Keyboard

2.3 Keys

Numbering 87 keys made of the same white matte plastic as the outer body, each with 1.5mm PBT-plastic keycaps, the keyboard layout follows the classic American (ANSI) style. However, three of the keys, the caps lock, f5 and scroll lock, have a clear plastic vertical rectangle on the lower side. This allows light from an indicator led attached to these keys' switches to escape and tell the user that the function for the key is initiated.

Figure 5 : Keyboard Layout

Figure 6 : Individual Keys

2.4 Cherry MW Switch Mechanism

Each key is set on a single cherry MW red linear switch. Being that it is linear, it makes no clicking sound while pressed and functions by sliding out of the way of the circuit when pressed (see figure 7). The switch mechanism consists of 3 parts, the metal circuit, the red plastic key and the spring directly at the bottom of the red key. By pushing the key down, the spring is tensed down and the circuit is closed.

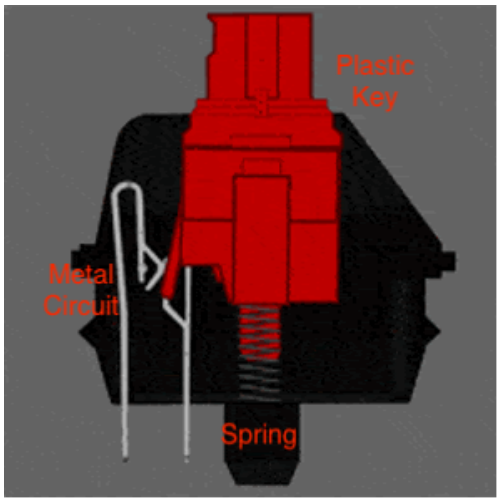

Figure 7 : Cherry Switch diagram

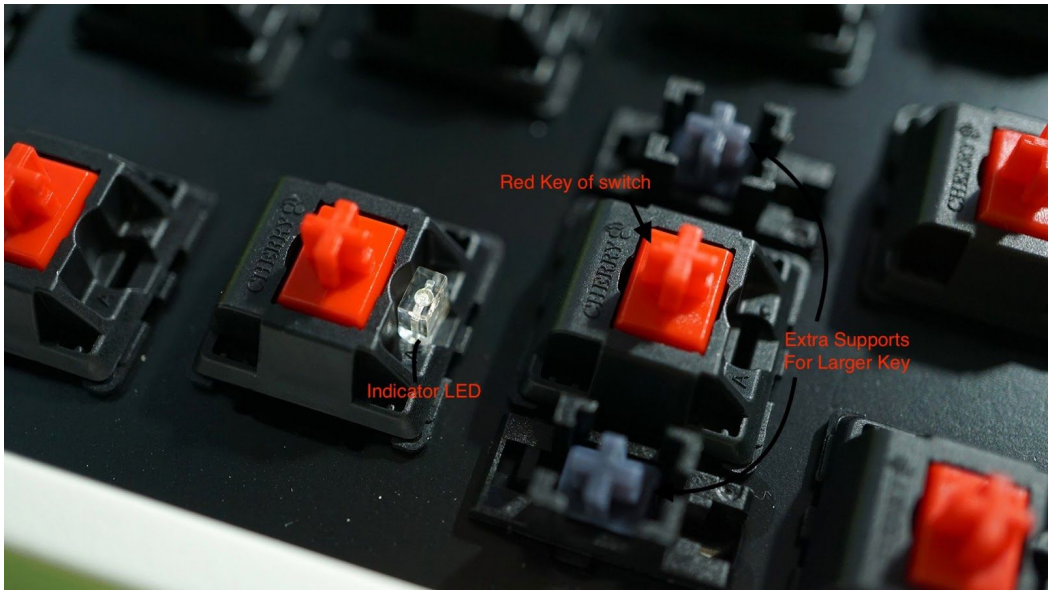

Figure 8 : Switches on the Keyboard

2.5 PCB

The PCB or Printed Circuit Board houses all the wiring responsible for sending each key input to the computer. The PCB has clearly seen individual wiring for each key, and with a yusb cable, connects to each key switch.

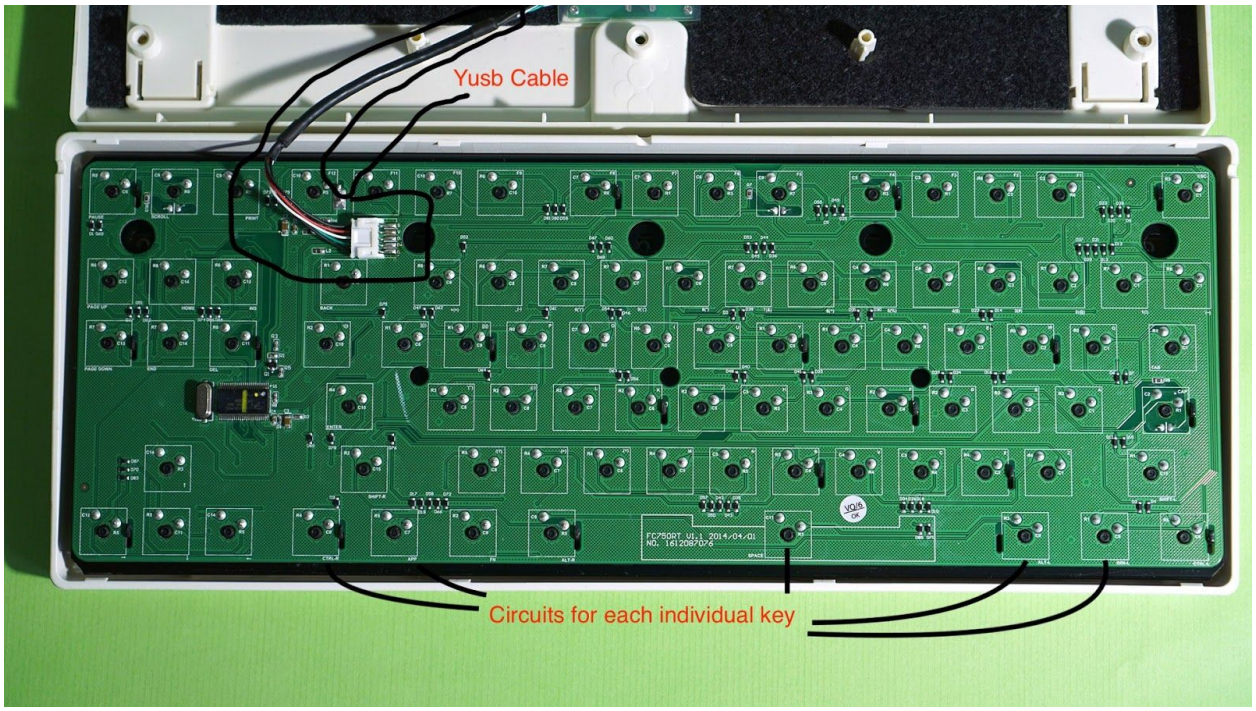

Figure 9 : Keyboard PCB

2.6 Noise-absorbing Substrate

An all-black cushioning layer of felt underneath the key switches keeps the keys deadly silent, stopping clicking of any kind from happening. Cut to form to cover every surface the underside of a switch touches, this feature is unique to the Leopold FC750R.

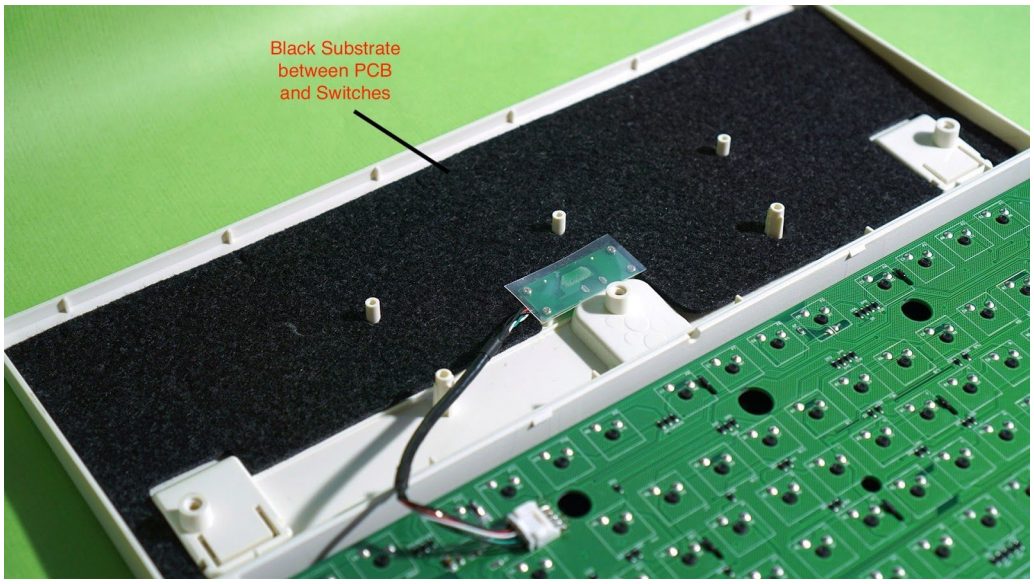

Figure 10 : Black Substrate

2.7 Mini-USB Port

On the back middle of the keyboard's outer shell, a mini-USB port can be found, which, by using the provided mini-USB to USB 3.0 cord, connects the keyboard to all computers.

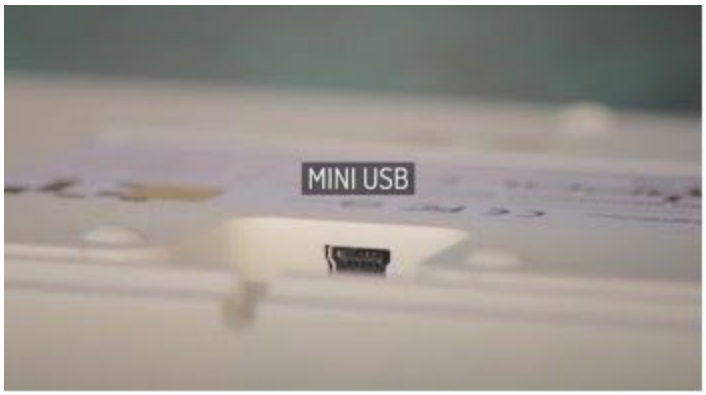

Figure 11 : Mini-USB Port

2.8 Accessories

Included with the keyboard are 5 items, a mini-USB male to USB 3.0 male cord, a USB 3.0 female to PS/2 male adapter, a stepped caps-lock key, a larger spacebar key, and a key removal tool. Using the cord and adapter, the keyboard can connect to any USB or PS/2 port on any computer, such as PC, Mac, or Linux.

Figure 12 : Accessories Laid Out

3 Conclusion

An integral part of every person's day, mechanical keyboards keep the internet running. Through a number of switches connected to a PCB, thousands of posts, blogs, books, and many other written pieces are created and sent everywhere on the world wide web. The Leopold FC750R, the keyboard in question, while not being the most advanced mechanical keyboard, shows the elegance and efficiency of the older, yet still popular technology.

Humans have always had the need to record the world around them. Of course, that started verbally through oral histories and storytelling, then transitioned to writing on pieces of bark and paper. However, by the 800s A.D., the first printing press was created and type became the new norm, and after that typewriters. Finally, computers were created and the means to record data on them was created, mechanical keyboards.

Making writing faster and easier than ever before, mechanical keyboards have had a substantial effect on humanity. While it has hurt people's ability to handwrite, with most people only typing up their work using a computer or phone, the mechanical keyboard has also done a lot of good for the world. Communication and written recording has become drastically easier and mistakes while writing are easily fixed. That used to be not the case, if using a typewriter or writing with a pen. Also, through the internet, mechanical keyboards have allowed easy communication with people all over the world. In the modern age, no other inventions have had as much of an impact as mechanical keyboards and computers.

4 References

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