

# GNG 2101 – Deliverable I

Prototype II and Client Meet Preparation

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During the development of any project, it is important to regularly evaluate and analyse the progress of the device. This progression can often be measured by the validity of the end device's prototypes. Prototypes can often help development teams test their products abilities and properties, and should therefore be made to accompany any intricate project.

The project undertaken by our development team is that of the specialized keyboard: an assistive device made for someone residing in St-Vincent's Hospital, Ottawa. The product is a motorized laptop rest (colloquially nicknamed the 'brick') that used a linear actuator to adjust the angle at which a laptop sits in front of the user. The current prototype showcases many of its abilities. Furthermore, there are several design implements that are yet to be installed that will aid its overall design.

## Current state of Product

The tactile product is largely unchanged from our previous deliverable – we have constructed parts that finalize its design but are yet to be physically added. Granted, the underbelly of the laptop rest has been polished slightly.

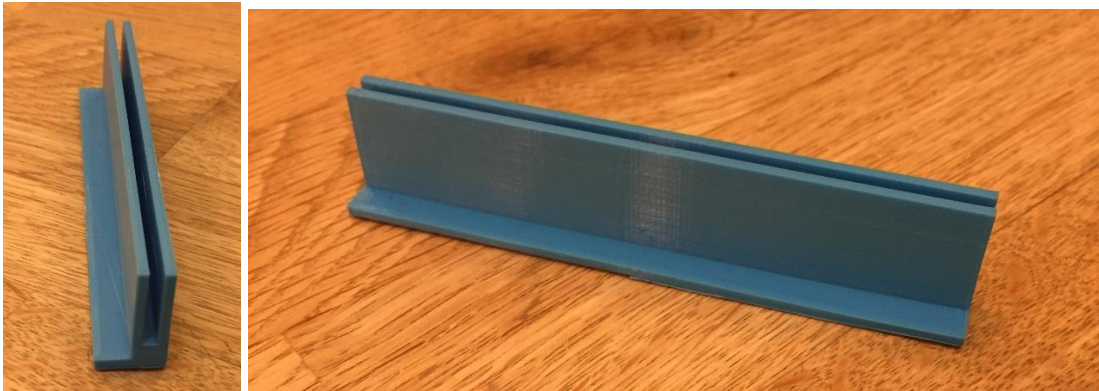


The current model houses the motor inside a steel case, welded together. The devices structure is virtually finalized – there is little improvement that can be made to it that will optimize it further. The device also currently uses a rocker switch, which allows for every input and implements bounce-back to the neutral state. Its issue is that the switch is not usable by the client, given his physical disabilities.

## Forthcoming Additions

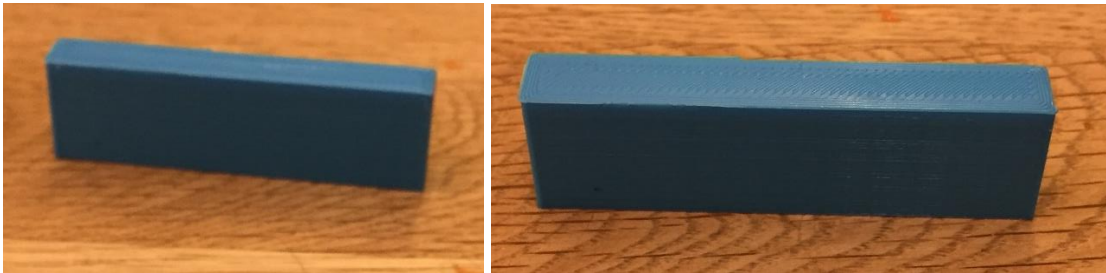
There are additions that have been prepared for the device but not yet added. These have mainly been 3D printed, to help make the device more accessible because the device must be operable for the client. At the very moment the device can be operated to adjust the angle. The main issue is that it is not optimized with the client in mind yet.

- Laptop hold extender:



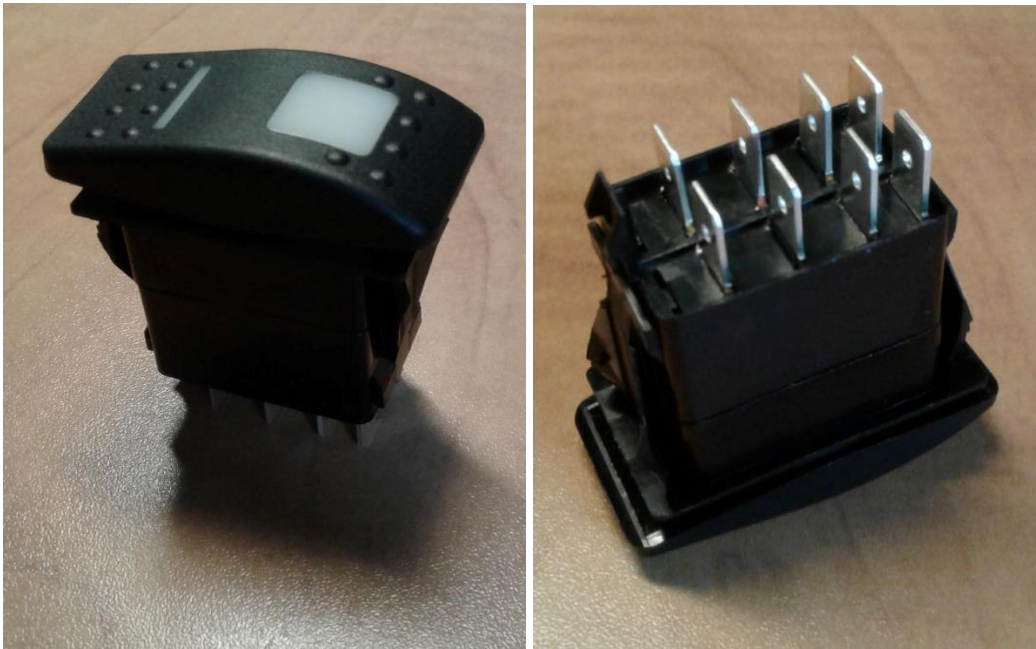
The hold extender was 3D printed to help keep the laptop in place whilst it sits on the surface of the motorized rest. The gap in the printed object is where the current hold fits into the place – we are unsure if the width is correctly calibrated for the device, given how uneven it is.

- Rectangular Support:



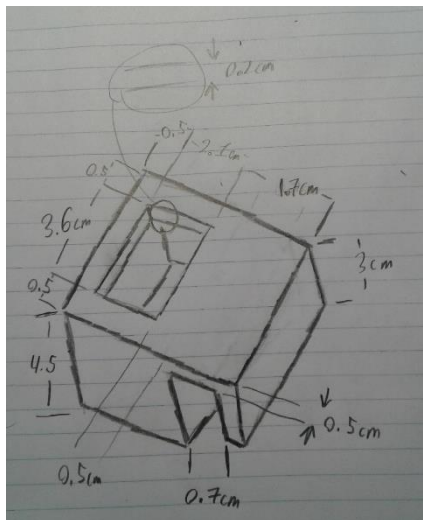
This very simply 3D print sits inside the device and provides support to the device. Force exerted on the joint is redirected to the print, lessening the strain induced on the joint and potentially allowing it to last longer.

- New switch:



We have ordered a brand new switch, of a more optimal design for the client. The device has seven pins to allow for connection (we require a minimum of six for our device) and, most importantly a switch with three states with bounce-back to the neutral state. Furthermore, the switch takes less force to press than our prototype's rocker switch. Whether it is easy enough for the client to use is yet to be known, but we can attach a rod to the switch later to give a press on each side a greater torque when operating the device.

- Switch holder:



A device we have conceptualized recently, the switch holder is a planned structure to be attached to the side of the product. This mechanism keep the switch in closer proximity to the client, allowing the user to use the device at greater convenience.

## Customer Feedback

Feedback on the device has been overwhelmingly positive. Our third and final client meeting with the client and his caretaker was received well by both. The sturdiness, height, function, and effectiveness of the device were praised by both. The main advice given by the client was to extend the length of the laptop stand's hold and to re-customize the switch. The former of this feedback was to ensure the client's older, bulkier laptop would stay on the platform. That latter was anticipated advice, as we knew the current switch would not suit the client's unique conditions.

The client meeting gave us some other insight as to how to improve our product. The client appreciated the concept of a container for his typing implement, as well as our idea to fix the switch to the side of the laptop stand in a location he can easily access. We will likely implement the latter of these mechanisms in our product, and the third one if we can find the 3D printing time.

The current state of the prototype was impressive to the client and his associate. Whilst there was some room left for improvement and upgrade, the device left a strong impression on its recipients, suggesting a fortunate conclusion to the project.

## Client Meet Preparation

The device is on schedule to be completed by March 29<sup>th</sup>, 2018. This is *Design Day*, the day that the engineering faculty presents its many projects to interested clients. Our development team has some preparation to undergo before the day comes, including preparing discussion points, poster and slideshow design, presentation points, and formal wear.

To validate the design we will just have people try out the stand, and get their feedback. We need to see if the switch is in the right place for most users, how long it takes to get familiar with the product and how quickly they can start using the product. We will also ask what they think can be improved about the design, or if there was anything that they didn't like.

## Conclusion

The progress we have made in improving our project has aided us in planning the rest of our project. Client feedback was a great influence on this, as well as the current strengths of the device. In light of this success, we have outlined the improvements we have yet to make, and begun planning how we intend to pitch the product in our upcoming discussions.