GNG 2101

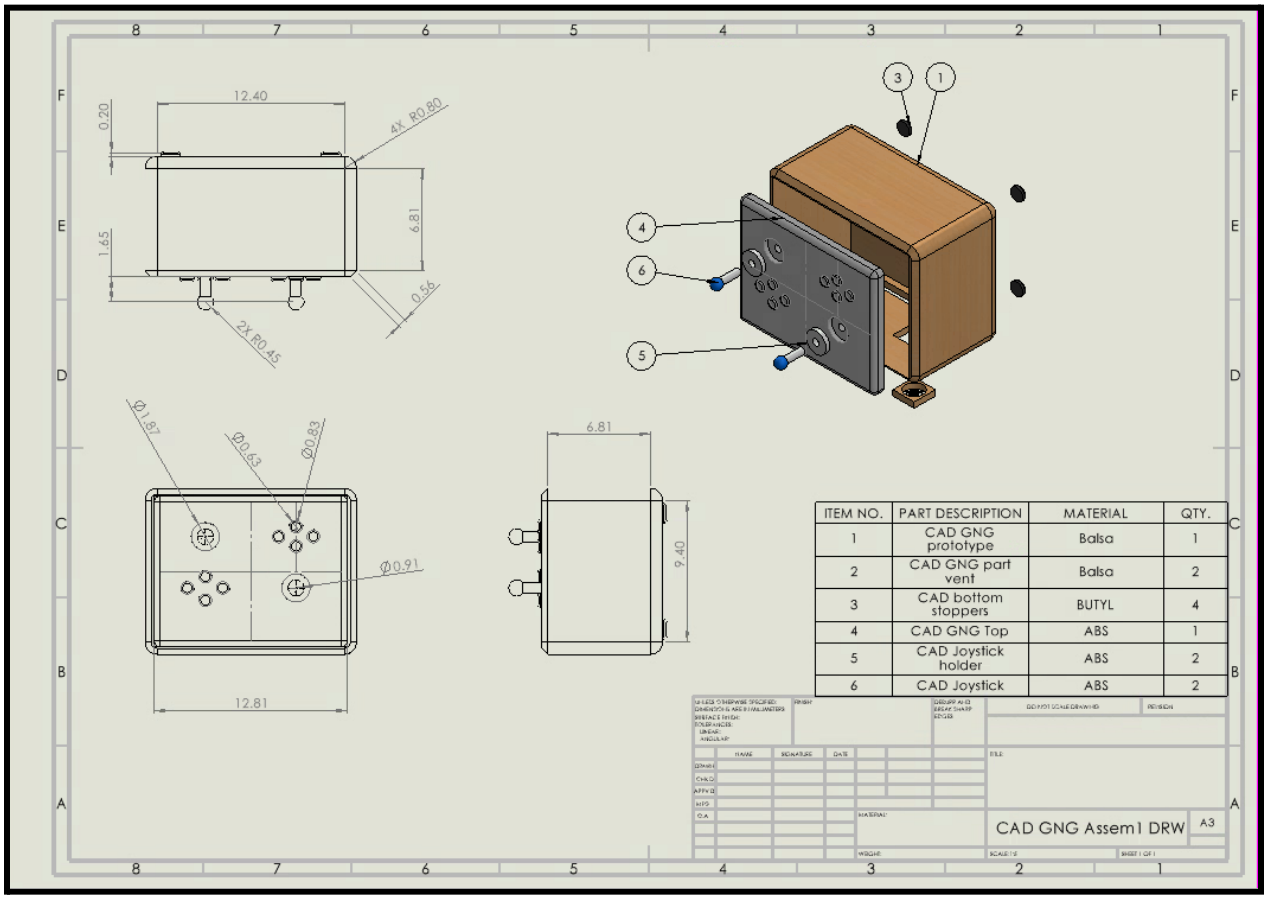
Project Deliverable D

Viktor Covete (300290425)
Oobishek Poinen (300185019)
Leul Shiferaw(300296010)
Isam Karroum (300233745)
Alberto Fong Hou (300215012)

1.Client Feedback

During the Client meet we used the design from summer 2023 GNG 2101 group as a comparison to our chosen design. The major changes are regarding the weight and the height/width or our model. Due to insufficient weight of the previous design the client is not able to use the adaptive controller with it sliding frequently, and hence we decided to add rubber feet for more stability. For the height of our design it was recommended to be lowered. Another change the client wanted from our design or the client disliked about the previous design is the Macro on the controller, it was said that “It is too complex” which imply we should minimize the numbers of keys we put on our design. For the additional functionality the client wants are: Bluetooth and macros.

2. Detailed design



ITEM NO.	PART DESCRIPTION	MATERIAL	QTY.
1	CAD GNG prototype	Balsa	1
2	CAD GNG part vent	Balsa	2
3	CAD bottom stoppers	BUTYL	4
4	CAD GNG Top	ABS	1
5	CAD Joystick holder	ABS	2
6	CAD Joystick	ABS	2

Prototype screen recording:

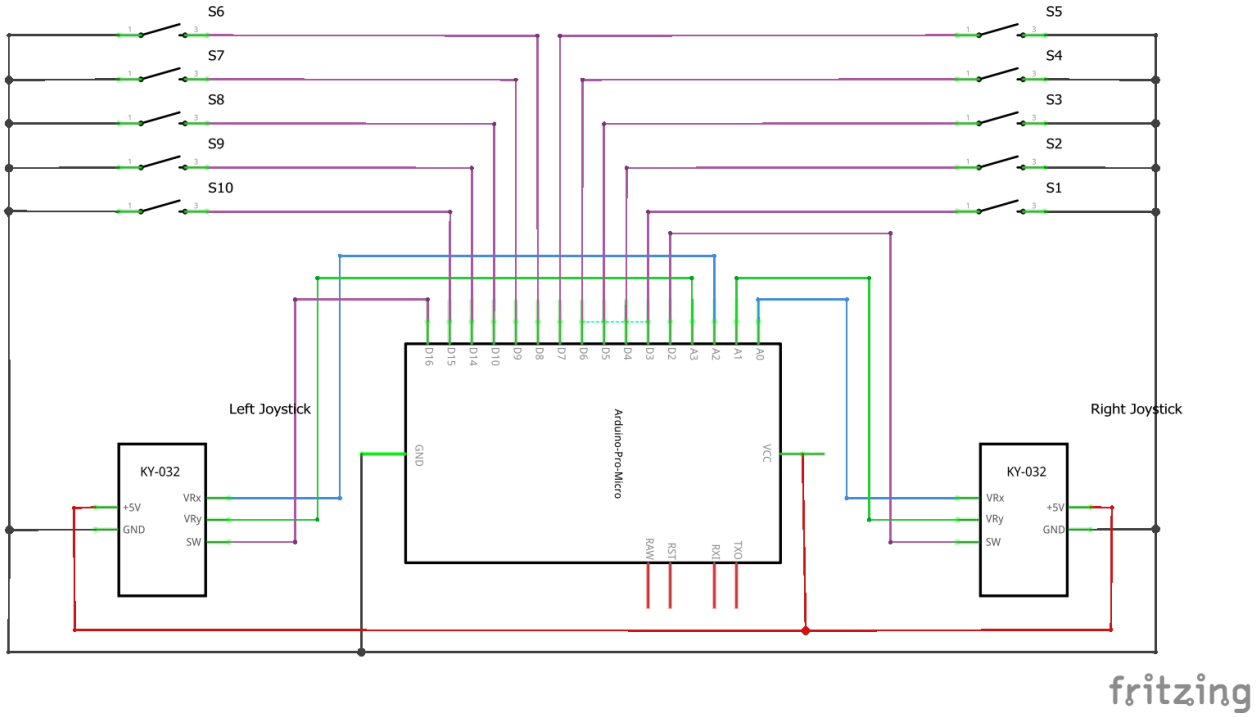
Regular view:

https://drive.google.com/file/d/1058sVVM6BhAgADal8Z4xjM4w5yFxgAyu/view?usp=drive_link

Exploded View:

https://drive.google.com/file/d/1Z_tQlxynKIa1JB7qMLjhXxYIgFzq1_nJ/view?usp=sharing

Detailed Circuit Design



3. Skills and Resources

Our team's software engineer has proficiency in python, java, html, css, Kotlin, javascript as well as program testing (mutation testing, coverage testing, method testing) which are transferable to any language we may need to incorporate into our controller's function. We have three electrical engineers with the expertise needed to construct the prototype. We also have a mechanical engineer capable of providing detailed CAD models to bring our early ideas into a conceivable prototype. We opted for MDF as material for the box. We need to purchase an arduino, rubber feet, wires, batteries, joysticks, buttons and a MDF board. We plan on purchasing these components within next week..

4. Time assessment to implement the design

For making the box, we would have to use the Brunsfield Centre. It will take approximately 6 hours in total to build the box which would require cutting the material to dimensions, drilling the holes for the buttons, rounding the edges, gluing the rubber pads and joining the sides of the box together. For the circuit, it would take an hour to implement the design. Then, coding will be done to ensure that the circuit is working and will take 2 hours. Finally, the circuit with the buttons and joystick would be put in the box for the final assembly which will take 30 minutes.

Two team members will be tasked with building the box, two with the circuit design and the coding will be one team member. Building the box will probably be done during reading week assuming the Brunsfield Centre is open(usually is for two days) and since there are no classes during reading week, it

will be more convenient for the team members constructing the box. Circuit design will also be done during reading week and coding should be done by the end of October. We already discussed the schedule but depending on material availability, delivery time and working hours of Brunsfield Centre, we may have to adjust our schedule.

5. Critical Product Assumptions:

As every product has a margin of error and not everything will occur as intended, it is important that assumptions are made to implement the design properly to ensure that there is as little error as possible. A critical assumption to make is the fact that the material we will be using for our project is not only affordable but also meets the clients needs. The material used is critical for the functionality of our project and after speaking with the client he asked for a product that doesn't move around. If our chosen material is not available, we might have to 3D print the box so ensuring that MDF is available is important as we may have to change the schedule if we have to 3D print the box. Another assumption is that the joysticks are easy and comfortable to move for our client. Since our client wants to play games that require a lot of precision it is important that we assume the joysticks match the clients needs. Another essential part for a good design implementation would be to wait for all the parts to arrive before making the box to ensure that all components will fit and any adjustments if necessary can be made on the dimensions of the box. Bluetooth implementation and macros

6. Preliminary Bill of Materials

Item Name	Description	Units of measure	Quantity	Unit cost	Extended cost	Link
MDF	**MDF Board for the box**	**Unit**	**2**	**3.00 $**	**6.00 $**	**https://makerstore.ca/shop/ols/products/mdf/v/M003-1-8-12-NCH**
Arduino Uno	**Microcontroller**	**Unit**	**1**	**17.00 $**	**17.00 $**	**https://makerstore.ca/shop/ols/products/arduino-uno-r3/v/A001-WTH-USB**
Thumb Joystick	**Joystick for controller(2 pack)**	**Unit**	**1**	**11.99 $**	**11.99 $**	**https://www.amazon.ca/dp/B0BFQTLM5T**

Push buttons	**Pack of 10**	**Unit**	**1**	**10.88 $**	**10.88 $**	**https://www.amazon.ca/dp/B07FKB6648**
Silicone Rubber Anti-Skid	**Rubber pads for the feet of the box**	**Unit**	**1**	**1.51 $**	**$ 1.51 $**	**https://www.amazon.ca/dp/B0CH6GLTKL/**
DC Power Supply Adapter	**Power adapter for Arduino**	**Unit**	**1**	**14.99 $**	**14.99 $**	**https://www.amazon.ca/dp/B09W96X88K/**
Wood glue	**Glue for joining the box**	**Unit**	**1**	**0.00 $**	**0.00 $**	
Total product cost (without taxes)					**62.37 $**	
Total product cost (including taxes)					**70.48 $**	

A team member has wood glue that is why the glue is free in the BOM and shipping is free since the first two items will be bought from the Makerstore and the remaining items from the Amazon total are more than 35 $ resulting in free shipping.

Project Plan Update:

WRIKE is currently not working. I emailed our PM and he said we can fix it at the next lab which is next week therefore for now the project plan will have to be updated next week along with Deliverable E's project plan update.