Brief overview of the project.

The arcade stick has not really changed into a commercial product and it is still seen as enthusiast's product. Part of the reason for that it is the arcade stick is still intimidating and doesn't accommodate how people hold it. For left handed gamers if they wanted to press buttons with their left hand and hold the stick with their right, a preferred option among lefties, then they will have to use the cross hand style. Cross hand is feasible for a cabinet since they are big and sturdy but not for a portable arcade stick which are smaller in comparison and is usually stationed the user's lap. Our solution to this problem is to craft an ambidextrous arcade stick. The idea is that you can flip it around, and it will reassign its buttons and invert its analog axes so you can keep on playing.

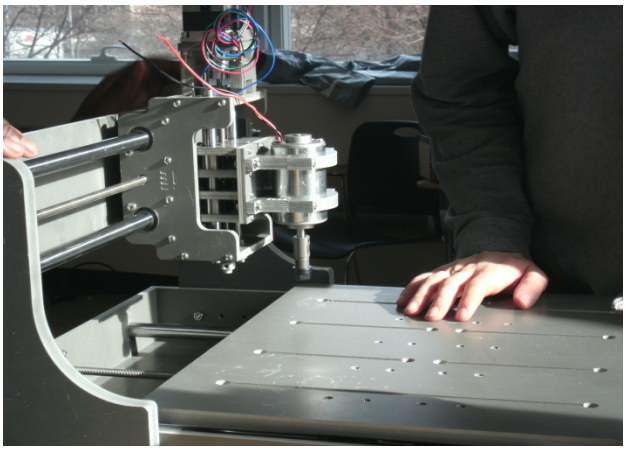
Longer documentation of how the project works, what you did etc

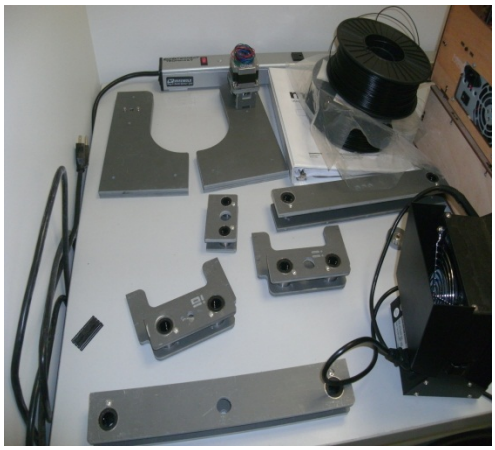
The Mill

One of the first things we needed to do was design a new frame to house the inner components. The arcade stick we were borrowing the components from was placed into a frame that would have a rather awkward layout if you were to spin it around and start using it. We then settled on having the buttons in horizontal rows so it will be exactly the same layout if you were to flip it around. We then set out on constructing the CNC Mill for the purpose of carving out holes for the buttons and joystick.

Putting together the CNC Mill became a project in and of itself. First finding it took longer than we all would have liked and it completely lacked instructions on how to put it together. We then had to use to Google to find some instructions on the internet. The first set of instructions found we pictures only and we later found out it wasn't for our model of the mill. We had to take the mill apart a couple of times after we "completed" it to make the appropriate adjustments.

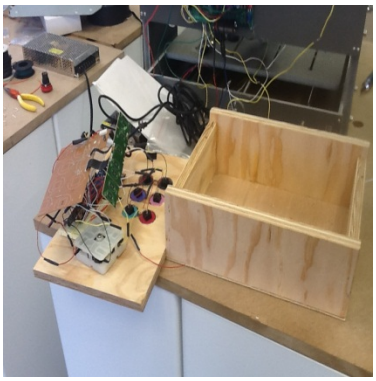
Once the body of the mill was corrected we had to find additional instructions on how to setup the power supplies, the brains, and the spindle. This is where we hit a dead end or rather where we gave up since it was sucking up too much time from everything else. The directions for installing the power supply weren't as clear as we would like and that's something that's actually dangerous. We have yet to come across directions for installing the spindle and its power supply. We then looked into other ways to make the holes.





The Shell

To make the shell we enlisted the help of a fellow Entertainment Technology student, Ariel Moye who has been a big help to us all sacrificing her free time to help us in the wood shop. Crafting the shell was much simpler than putting together the mill since essentially we are making a box out of wood but it's actually more complicated and potentially dangerous if you don't know what you are doing.

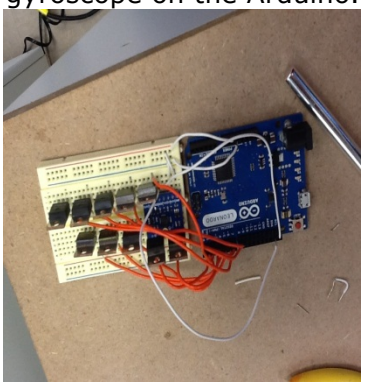


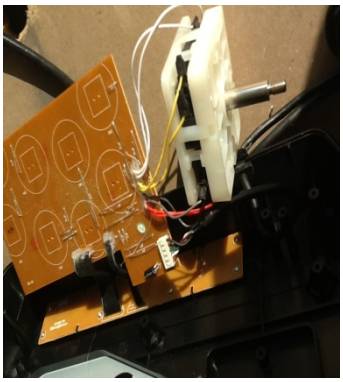
We made the shell by dividing it into 6 parts and making those individually according to our measurements which we got from our original arcade stick. After the components were cut out we put them together by first gluing them with wood then stapling them. All the pieces were put together except the top which we need to put the holes into for the buttons and joystick. Since the mill is a bust we have to drill holes in to the top piece manually.

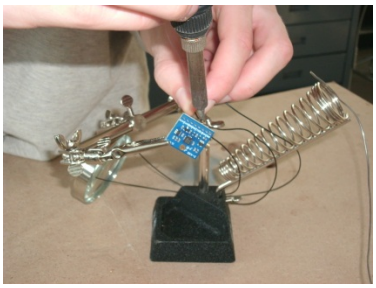
We ran into some issues with drilling holes because we lacked the proper drill bits we need to replicate the original panel layout so we have to improvise a little.

Gyroscope and Code

Just like with the mill actually getting a gyroscope took longer than what we would have liked. We were under the impression that there was a gyroscope in the school but it was never found. We eventually bought a gyroscope from Radio Shack for around 40 bucks. We then soldered some wires to the thing out and we weren't getting any input from it gyroscope was programmed with code from parallax.com. Sca and sda ports were specific for the gyroscope on the Arduino.







Remy Octavian

We spent an unfortunately large amount of time on the CNC Assembly's been strange. The kit was ordered 2 years ago, and when we started assembling it we were unaware that there had been revisions to it. As a result, a part was excluded until late in the process, and the inclusion of said part delayed construction by a day.

Construction went pretty smoothly, but wiring stopped that aspect of the project dead in its tracks. The instructions for power supply wiring used a different unit than what we were provided with. It wasn't clear whether or not we were supposed to wire our - wires to ground, and no one wanted to fry the thing, so we dropped it and manually drilled the holes for the face late of the joy stick.

The actual wiring of the whole thing has thus far been very easy. I worked out that if we were connect the buttons to the Arduino, and the Arduino to the original joystick, we could change the button mapping seamlessly. Turns out we had exactly the right number of pins on the Arduino too, and dedicated SCA and SDA pins for our gyroscope. We threw in a few transistors between the joystick board and the Arduino, and that enabled us to easily control the flow of electricity to simulate button presses to the joystick.

The gyroscope was slightly tricky. We used the available wire diagram and code to get it working, and that failed because the wires we leading to the analogue inputs. The discovery of I2C pins made it work in a snap.

All that's left to do is get our code working properly with pin and button layout, figure out some code to determine our current angle, and we're done! I hope the joystick's original circuitry plays nice.

Ibn Frazier

My projects were to keep a blog of everything I did. To point out what wasn’t finished in my task list and apprehend that. And be a leader and a resource. First job was to locate a calibrator syntax in which we could develop a result from a problem that was considered to be distant but needed for our controller. Since then we searched for a gyroscope, yet I was unable to find one. Next job was to develop a piece by piece assortment of the cnc mill, and to begin assembling it. My first task with this was to mend a server motor to a frame that controlled the spindle; it seemed a very easy task. Next job was to find a table clamp so that we didn’t break every frame by jamming the two together with arm strength and feet force. Yet we did use are limbs and did pretty good. Later that day we apprehended a table clamp. Next I drilled several frames together assuring that each end piece exactly matched the diagram given, and this meant that numbers needed to match. My next task was to assemble rods with some having screw threads and others having none. The idea was to bolt these to the frames and use the threaded pieces to suppress the server motor actuator. My next task was detached every piece so that a nut would be completely attached with a spring in the middle. This meant that the nut had two ends with threads for the threaded rod and suppressed a spring in the center. I felt as though I failed at this task, but it was great that I disassembled the cnc mill, because these nuts came in a set of three meaning all three server motors would need one attached to the suppressed threaded rod. My next task was to solder the gyroscope to power, serial, and ground. After this I soldered several ground and power cables for the battery and microcontroller. I attached these cables to their components. Next I helped to drill several screws into the frames of the cnc mill to attach the cables that were connected to switches.

This meant that each cable was attached to the frame closes to the server motor. Lastly I soldered the cables to the board used for the ambidextrous controller.

Ahmad Woods

Ahmad mainly handled the constructing of the new shell to house the stick components with the help of his friend Ariel Moye.

We all soldered components and help construct the CNC Mill.