

Arcade Stick

Project Description:

I have designed and built an arcade stick a few years ago. It has been used for around 150-200 hours and it has stayed in a pretty good condition. It still works just fine; all buttons work and there hasn't been ever any problems with the controller. Problem is that the 3D printed casing for the arcade stick has some problems. First of all sidewall of the casing is cracked on the area where side buttons (Start, Select, see picture 1) are located. It also has quite a sharp curvature change in top part which causes it to chaff skin near wrists. Also, the bosses at the corner have worn out and sometimes while using the controller you can notice that one corner starts rising or even pops out of the lower casing. I would also like to have it be a bit larger and heavier. Now it is a bit too narrow for my comfort and it moves around too much when spinning the joystick heavily during gameplay. It's a bit too narrow because it had to be printed in multiple parts because it couldn't fit on print bed otherwise. Another issue is the quality of the components used in build. They are cheap Chinese copies of Sanwa buttons and joystick. Buttons have quite a lot of play in them, and they don't feel snappy when used. I would like to have better quality buttons. The power cable also would benefit from strain relief, currently it has none, it is possible to rip out the cable from PCB by pulling hard.

Initial situation:

There is no access to old 3D models everything needs to be modelled from scratch

Joystick and button 3D models can be found by searching but a few years back dimensions didn't match the actual product.

Button layouts with dimensions are available at slagcoin. [Link to site](#)

New arcade stick is going to be modelled to be manufactured by injection molding.

Components:

Components to use to build the new arcade stick are going to come from old arcade stick since they are still usable. Additionally, a new set of buttons and joystick can be purchased for a second arcade stick. If new buttons and joystick are bought/installed hole sizes and position might need to be changed to fit the new components.

Components used in build:

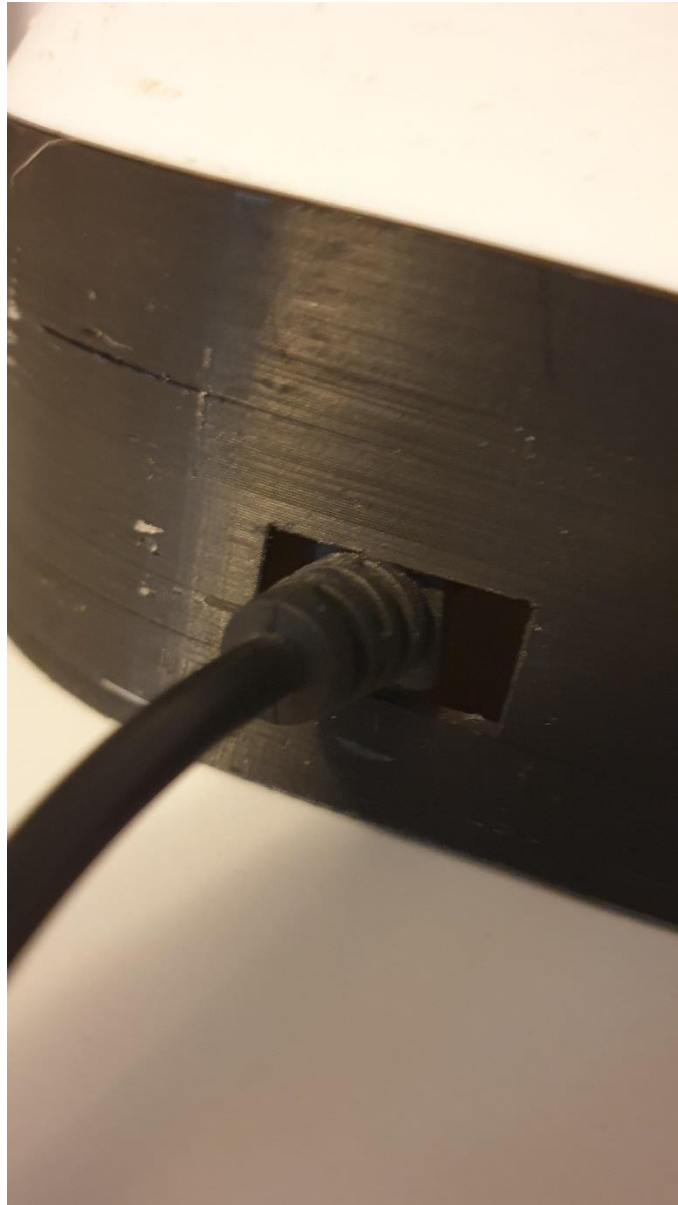
Zero Delay Encoder	Available: Aliexpress Link to Chinese Sanwa copy set with all necessary components. FocusAttack Sanwa Denshi lineup from Focusattack for better quality components
Large Buttons x8	
Small Buttons x2	
Joystick	
Joystick cable (5/8 pin depends on square/octagon gate construction)	
Button wiring x10	
Power cable	

Before pictures:



Picture 1: Crack in the sidewall

Buttons have snaps which keep the buttons in place. The initial deformation needed for snap to pass through the hole was enough to tear layers apart. Hard usage after that has caused the tear to grow bigger and more crack have also appeared due to material age. Material used for casing was ABS.



Picture 2: Power cable passthrough

I was planning and modelled TPU strain relief for this, but I never had a chance to print it out. Also notice a crack on this side + PVA support material in between layers. Overall, the print quality is not that good, but you can't really expect more from FDM process. I should have finished surface off with acetone smoothing + grinding. Also, it was the first time trying out the material in Ultimaker machine and settings weren't yet optimized. Material used was BASF Ultrafuse ABS Fusion+. [Link to material](#)



Picture 3: Top view of the Arcade stick

From this you can see the button layout and the split construction of the casing. The small edge that forms between each layer also is good at trapping all sort of grime. That's why you should never use 3D printed parts for food preparation.