

Function Proposal

Hardware

- Inputs
 - Pushbuttons
 - Function - Control navigation and the states of device
 - Up - Allows users to navigate up through game and menus
 - Down - Allows users to navigate down through game and menus
 - Select - Allows users to choose selections in game and menus
 - Power - Allows Users to turn the device on and off
 - Source:
<https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32/experiment-5-push-buttons>
 - Muscle Sensor
 - Function - The muscle sensors will be used for the in-game controls
 - 4 sensors - can connect to any desired muscles
 - They can be read as simple analog inputs
 - Source:
https://www.alibaba.com/product-detail/Muscle-signal-sensor-EMG-Sensor_60722404663.html?spm=a2700.7724838.2017115.1.478e5fd5Pjccct
- Processing
 - Arduino Pro Micro - This device will have enough inputs and outputs to connect all of the necessary buttons and controls.
 - Source:
<https://learn.sparkfun.com/tutorials/pro-micro--fio-v3-hookup-guide>
- Outputs
 - HiLetgo 2.2 inch 4-Wire SPI TFT LCD Display Module: This screen is the perfect size to play small, handheld games. It's colors and 240x320 resolution will also be great for displaying a variety of games. In addition, it can be powered by a 3.3v or 5v power source which will work with our LiPo battery. Also, it only requires 4 IO connections which will allow for less of the Pro Micro IOs to be used. It is also compatible with [Adafruit_ILI9341](#) arduino library. In addition, it has an SD card slot which may be useful to increase storage for the game(s).
 - - Source:
https://www.amazon.com/HiLetgo-4-Wire-Display-240x320-ILI9341/dp/B01CZL6QIQ/ref=sr_1_14?s=electronics&ie=UTF8&qid=1517345706&sr=1-14&keywords=arduino+tft+screen
- Power
 - 1200 mAh LiPo Battery - This battery will provide enough power for the MGM to be played for a reasonable period of time.
 - Source: <https://www.adafruit.com/product/258>

- TP5410 - LiPo Charger/Boost Converter - This add-on prevents the battery from short circuits and over/undercharging the battery while boosting the voltage up to 5v.
 - Source: <https://www.youtube.com/watch?v=aND0j2Y2IkM> and <https://www.ebay.com/itm/191990401129>

Software

- Arduino IDE - This software will be able to control communications between the external sensors and the game.
 - Source: <https://www.arduino.cc/reference/en/>
- Muscle Sensors test software - This software will be used to test and gauge the muscle sensors.
 - Source: <https://github.com/AdvancerTechnologies/MuscleSensorV3>
- Adafruit GFX Library - The GFX Library allows for quick interfacing for drawing text, simple graphics, and bitmaps to screens.
 - Source: <https://learn.adafruit.com/adafruit-gfx-graphics-library/overview>
- Arduino TFT LCD library - This library enables an Arduino board to communicate with the screen and helps with drawing shapes, text, and images.
 - <https://www.arduino.cc/en/Reference/TFTLibrary>