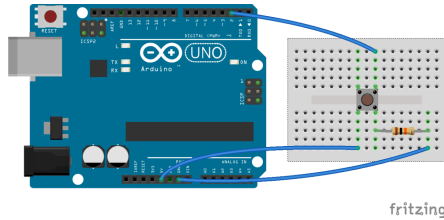# Function Proposal

Inputs

- Pushbutton
    - There will be 4 tangible buttons that let the user make decisions between options displayed on the screen
        - Right
        - Left
        - Enter/Play/Pause/Power
        - Harmony
    - https://www.arduino.cc/en/tutorial/pushbutton

- Mini Boat Rocker Switch
    - This will serve as the on/off switch
    - https://www.amazon.com/FBApayipa-Solder-Rocker-Switch-Toggle/dp/B01N2U8PK0/ref=sr_1_4?ie=UTF8&qid=1518135004&sr=8-4&keywords=switches
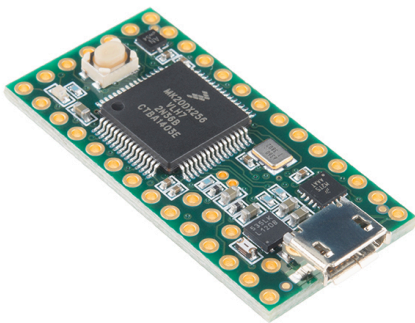

- Electret Mic MAX9814
    - The sensor will detect the notes being sung by the user.
    - https://www.amazon.com/WINGONEER-MAX9814-Electret-Microphone-Amplifier/dp/B077XB5Y4X/ref=sr_1_2?ie=UTF8&qid=1518135944&sr=8-2&keywords=max9814+mic
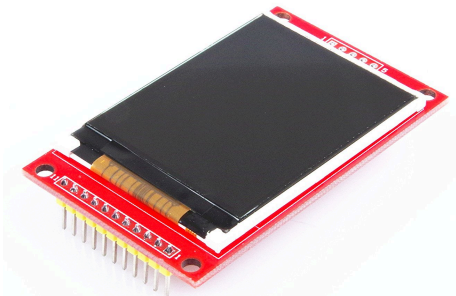   - https://cdn-learn.adafruit.com/downloads/pdf/adafruit-agc-electret-microphone-amplifier-max9814.pdf
    - https://www.maximmintegrated.com/en/products/analog/audio/MAX9814.html/tb_tab0

- Thumbwheel Potentiometer
    - This will control the volume of the melodic note.
    - http://www.schattendesign.com/thumbwheels.htm
    - https://www.build-electronic-circuits.com/potentiometer/
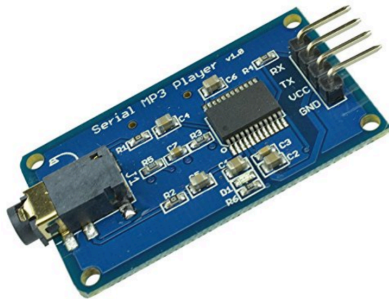
Processing

- Teensy 3.2
    - I chose this platform because the Teensy is strong enough to transfer large amounts of data effectively (like audio signals and files) and it has enough I/O pins for my design
    - The downside is that there might potentially be library issues since it is not specifically Arduino brand
    - https://www.pjrc.com/teensy/td_libs.html
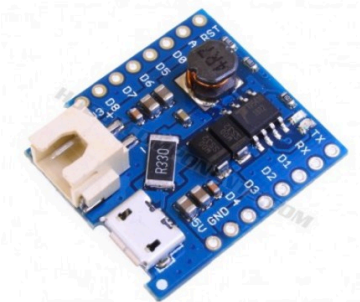
Outputs

- 2.2" TFT Color LCD Display
    - This screen was the best choice because I needed a colored screen to indicate whether the singer is sharp or flat, but still wanted something fairly small

- It will display the music staff with the notes being sung/played as well as the different mode options
- https://www.amazon.com/KNACRO-2-2-inch-Arduino-interface-development/dp/B01GFSWW9C/ref=sr_1_7?s=electronics&ie=UTF8&qid=1519245753&sr=1-7&keywords=2.2%22+tft
- https://learn.adafruit.com/2-2-tft-display/arduino-code
- https://www.pjrc.com/teensy/td_download.html

- **Aideepen YX5300 UART Control Serial MP3 Music Player Module**
  - This has a headphone port so that user can hear the melodic note(s) that they are trying to harmonize with
  - Supports MP3 and WAV files
  - http://www.da-share.com/misc/catalex-mp3-board-yx5300-chip/

Power

- **TP5410 LiPo Charger**
  - This will convert power and allows for recharging LiPo batteries as well as indicating when charging is in progress or complete
  - https://www.youtube.com/watch?v=aND0j2Y2IkM
  - https://www.ebay.com/itm/191990401129

- 1000 mAH LiPo Battery
  - https://www.ebay.com/i/181689356203?chn=ps

- 9V Battery (2)
- https://www.amazon.com/AmazonBasics-Everyday-Alkaline-Batteries-8-Pack/dp/B00MH4QM1S

Software
- Arduino IDE
  - This will communicate and store all code to/from the desired inputs and outputs.
  - https://www.arduino.cc/