

# ENGI 301

## <keeper of Pace>

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<Date: 10/3/21>

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# Background Information



- What is being proposed?
  - Goal: create a device that can help a runner or walker maintain a specific speed set. This is very similar to a smart watch yet the main goal isn't to track distance, rather tell the user to maintain a specific speed or alert the user of their deviation from the goal set speed.
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  - Reachable goal for device: accurately report and give feedback to user to maintain a speed of 60 steps per hour, through walking or running

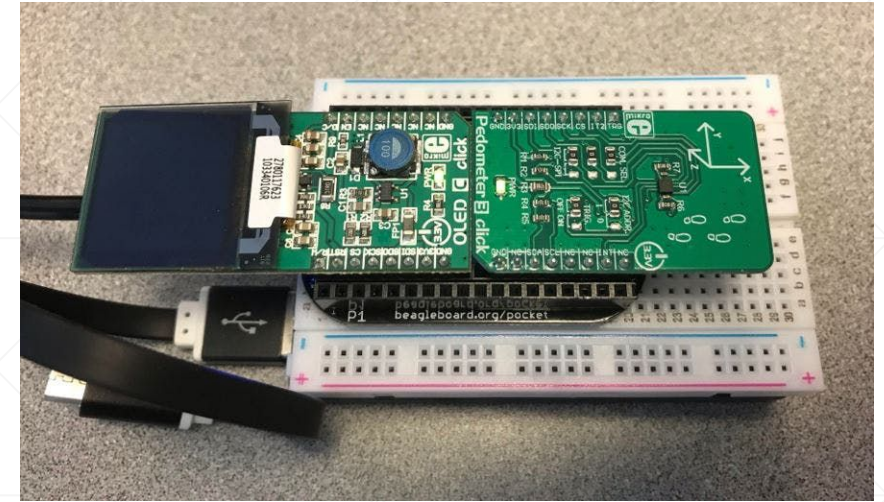
## What is your story?

- I myself was inspired by running in the morning and had a goal to maintain a specific speed. with this device, I hope to have a way to do this myself and explore what design works best for this. I run in the morning and work to maintain a speed of 7.5 miles per hour. For this project I would like to have the device work for walking speeds before I can increase to running speeds
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# What Has been done before

Link [Here](#) and [Here](#)

- Here, Jennifer Hellar used an accelerometer and a display with the pocket beagle to count the steps that her dog took.

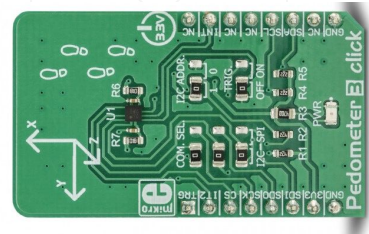


What would be adopted and changed:

- The device would have to focus on calculating the speed rather than just the steps taken, This can change the need for the display as the main goal is to interact with the user by telling speed rather than steps taken. Two ways for this feedback to happen: with a light beeping for feedback, or have a speaker for feedback.
- The software for this implementation will be different as its main goal is to measure speed, not distance, this can be done through changing the provided manufacturer libraries.

# Component Explanation

- This device will utilize two components (Aside from power supply and pocket beagle itself):
- 1) - PEDOMETER 3 CLICK
  - This component will be responsible for gathering the data of movement. Pedometer 3 click is equipped with the KX126-1063,  $\pm 2g$  /  $\pm 4g$  /  $\pm 8g$  /  $\pm 16g$  tri-axis digital accelerometer, by Kionix.
  - Manufacturer provides several libraries that can be used as a starting point for my implementation
- 2)- Hex display
  - This device is responsible for a display, showing the amount of steps per unit as well as steps
- 3)- 4 buttons
  - four functions for changing and interacting
    - yes/go, no/pause, change up, change down
- 4)- Bluetooth component
  - can give messages to phone through attaching the pocket beagle to a Bluetooth USB Dongle
- 5)- Buzzer and vibration motor
  - This component will be used to alert the user about pace speed changes

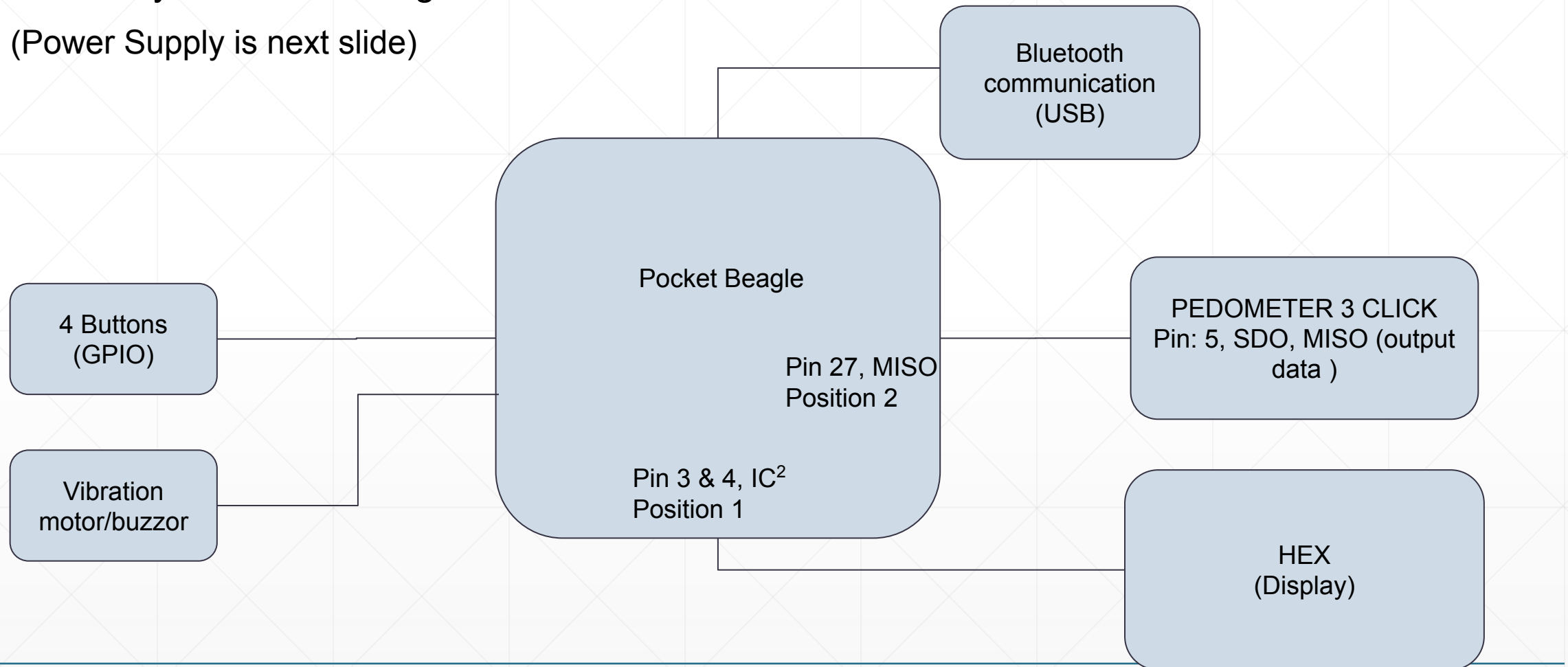


# User interaction plan

- 1)- Four buttons
    - yes/go - This starts the pace making, after pressing this, the device will start buzzing if off pace
    - no/pause - stops recording or stops keeping pace, after this, the device will only display total steps
    - change up - change pace to be higher
    - change down - change pace to be slower
  - 2) -Code for steps per minute
    - The current code library can count the number of steps taken
      - However, change will be made such that the code can measure the rate density of steps taken during a time interval and these will be displayed on the HEX
  - 3) - Buzzer
    - This will be how the user finds out if they are not at the desired pace, the more the user is deviating from the pace, the more the buzzer alerts the user
  - 4)- Bluetooth
    - This will be the final implantation for the project, this will communicate with a phone or another device which can thus communicate more information. The reason this will be the last part is because it is the least necessary portion of the project.
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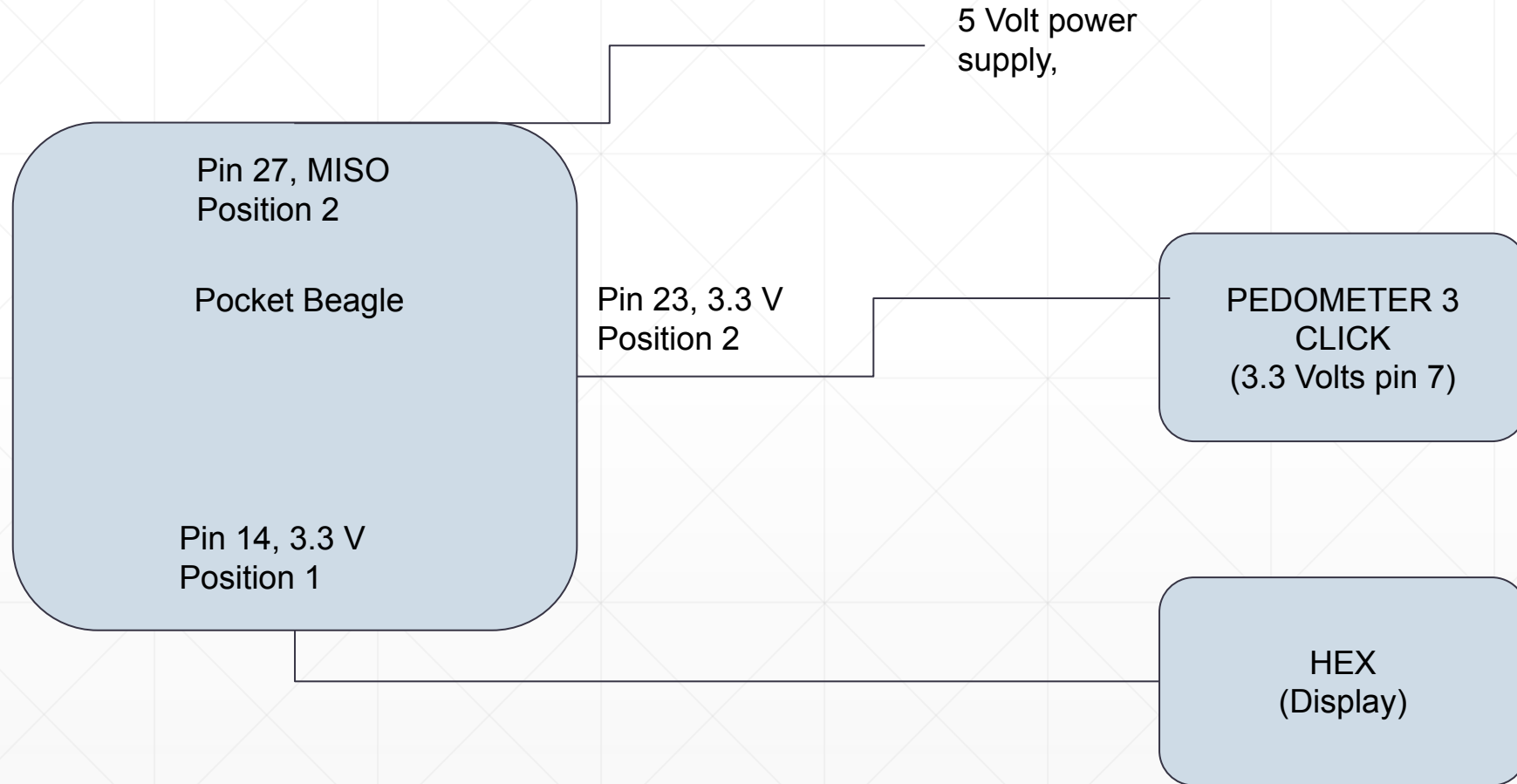
# System Block Diagram

- Create a System Block Diagram
  - (Power Supply is next slide)



# Power Block Diagram

The Power Supply will need to be portable





# Components / Budget

Component	Need to Buy	Cost
PEDOMETER 3 CLICK, <a href="#">link</a>	yes	13.00
OLED C CLICK, <a href="#">link</a>	yes	29.00
DC portable 6 Volt supply, AA	in OEDK	
Bluetooth dongle	maybe	~20

Need all components to be purchased by instructor listed; additional components may be purchased by student