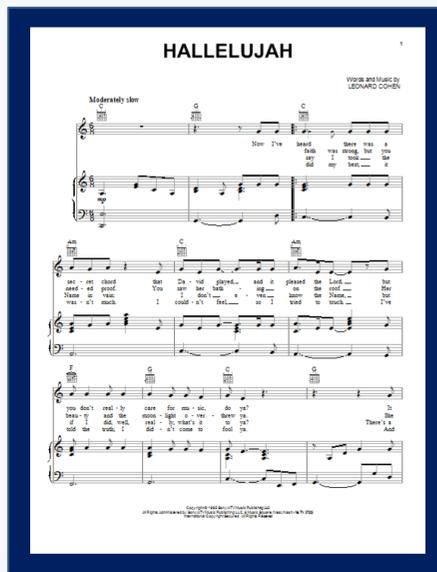


# Song Choices

## TOP EIGHT

- ❖ "Hallelujah" - Rufus Wainwright
- ❖ "21 Guns" - Green Day
- ❖ "Shipping Up to Boston" - Dropkick Murphey's
- ❖ "Awake and Alive" - Skillet
- ❖ "All the Small Things" - Blink 182
- ❖ "Walk the Line" - Johnny Cash
- ❖ "Blackbird" - The Beatles
- ❖ "Imagine" - John Lennon

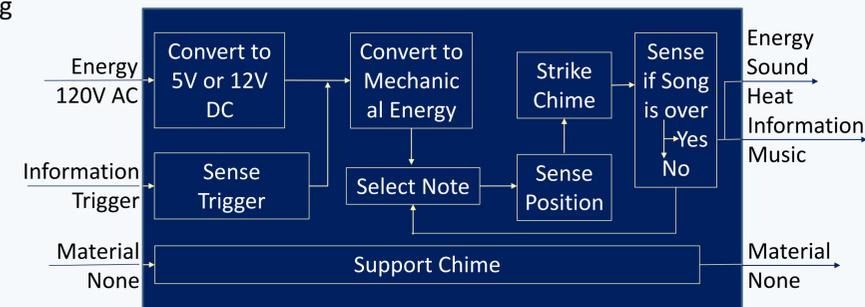
Hallelujah was chosen as our final song choice because of the results it received after going through two Pugh Charts. Our original choice was Shipping Up to Boston, but after completing the charts we learned it was much faster and would be harder to remake with chimes. Hallelujah then became the front runner because of how versatile it was with also being very recognizable.



# Programming Background

Our chime machine has three different ways in which programming allows the solenoids to strike the chimes. Four chimes are controlled through potentiometer feedback, four through switches, and the last two have designated solenoids. This sensor feedback ensures that our solenoids will always align with the chimes, regardless of variability in motor speed or timing.

## FUNCTIONAL DECOMPOSITION



# Chime Info

Note	Expected f (frequency)	Pipe Length (inches)	Actual Length (inches)	Actual f	Difference f
C5	523.25	20.229	20.688	526	2.75
D5	587.33	19.471	19.469	585	2.33
E5	659.25	18.379	18.375	657	2.25
F5	698.46	17.855	17.8125	702	3.54
G5	783.99	16.853	16.875	786	2.01
A5	880	15.907	15.875	877	3.00
B5	987.77	15.014	14.875	1000	12.23
C6	1046.5	14.587	14.5625	1041	5.50
D6	1174.66	13.768	13.625	1175	0.34
E6	1318.51	13	12.8125	1325	6.49
Total		162.58	164.9695		

Simplified chime length equation:

$$l = \sqrt{\frac{222675}{f}}$$

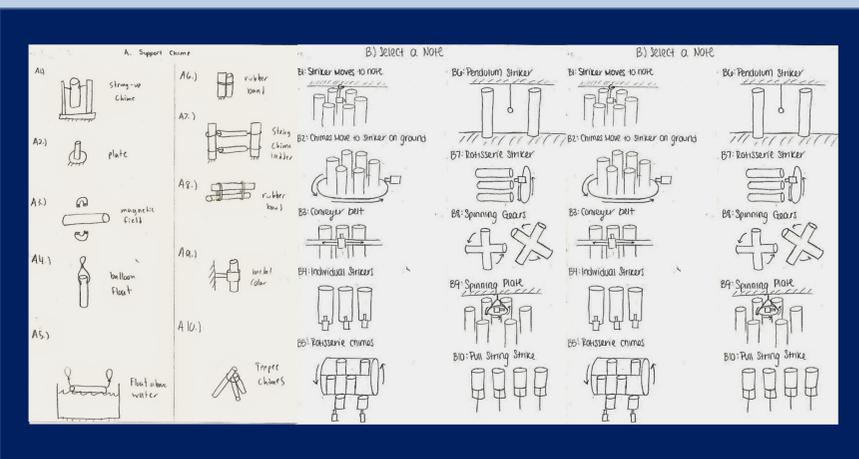


Sydney Lizarazo, Nathan Mckerley, Steven Paine, and Victoria Tripp

# Changes

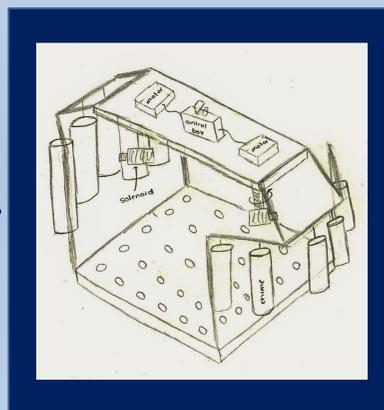
If we were to redo any part of our design process it would have been to figure out how to reliably hang the solenoids at a sooner time. Besides this, we agree that our structure and other design components work very well with one another and are the best fit for our song choice.

## DESIGN COMPONENTS



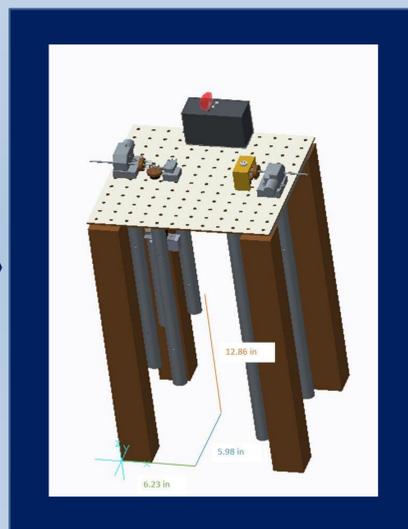
These breakdown of components were the first sketches that began our design process for our robochime.

## FIRST DESIGN



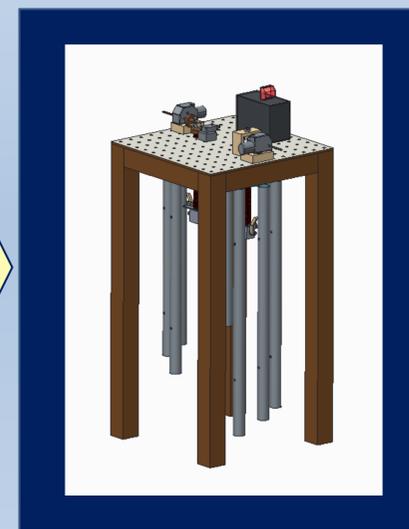
Putting our design components together we came up for ten complete robochime designs and agreed this design would work best with our song choice and number of chimes.

## FIRST CAD



After reviewing our materials and cutting our chimes we tried to simplify our overall design which resulted in this first CAD design.

## SECOND CAD



As we began to build our robochime we realized we had much more wood than originally thought so we changed our second CAD to have more support with wood than our previous CAD.

## FINAL MECHANISM



Going off of our previous CAD we decided to rearrange our chimes and incorporate stationary solenoids to help with timing of the song and we also decided to save material by only leaving enough wood material to hold the solenoids on the side.