FINAL PROJECT PROPOSAL

“ARDUINO MIDI TRUMPET”

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Last revised 11/15/2020

Project Description

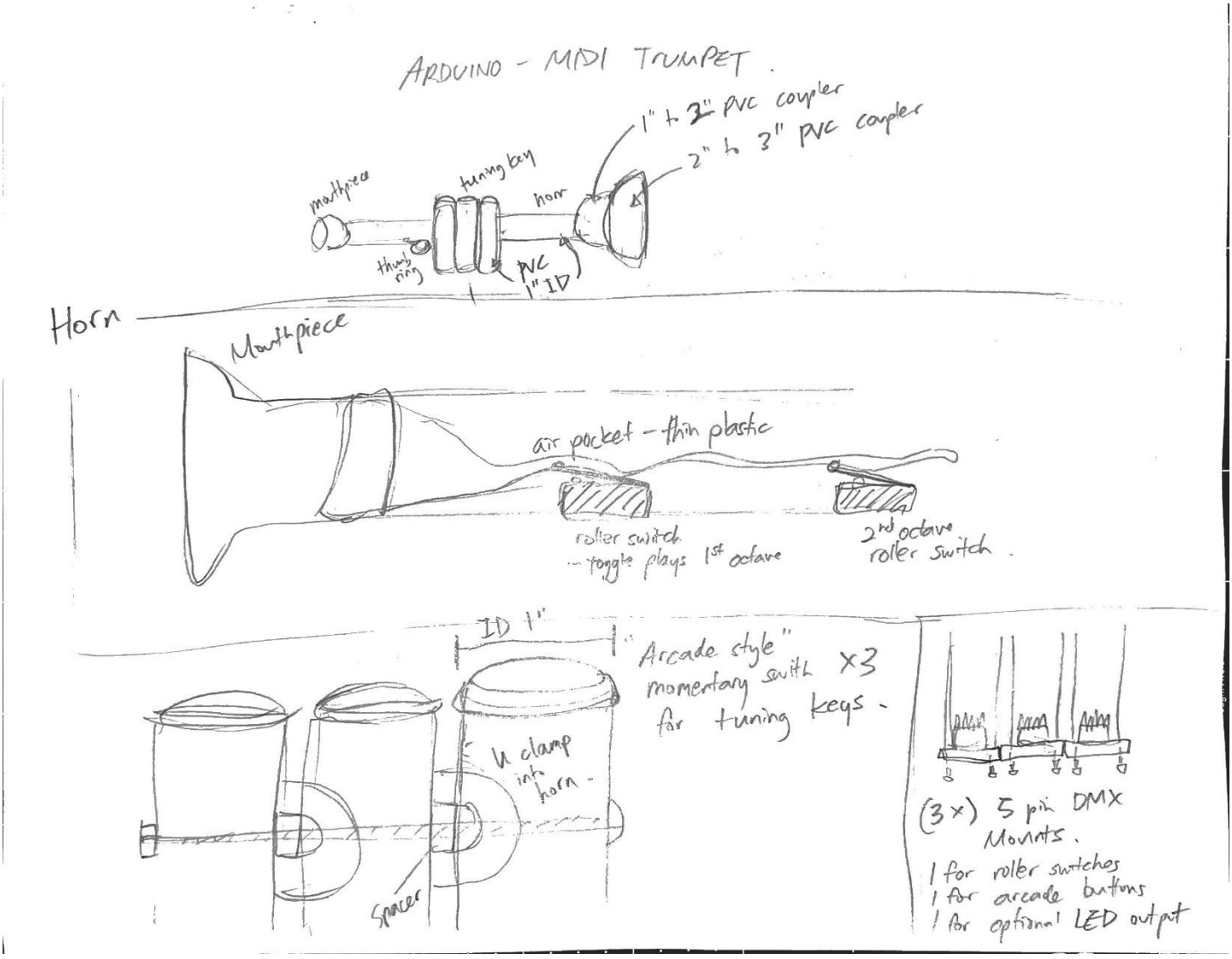
There are many MIDI controlled instruments that are becoming more complex and realistic as technology improves, but there is a lack of woodwind MIDI instruments in the market due to the difficulty of translating breath sensitivity to MIDI bytes.

For this project, I will be building a simple MIDI trumpet with one octave capability.

The “registers” of notes that are achieved with breath and embouchure will be achieved by using a plastic air pocket that fills the tube of the horn and activates either one of two roller switches depending on the amount of air being pushed into the instrument.

The 3-combination note valves will be replaced by 3 arcade buttons that will be programmed to have the same key fingering combinations.

The instrument will connect to Arduino by two 5-pin DMX cables, and Arduino will communicate to Processing, which will output MIDI bytes virtually to the machine.



TRUMPET BODY CONSTRUCTION

1” Sch 40 PVC pipe for horn pipe and valve keys

Horn end – 2” x 1” PVC reducer socket end

<https://www.pvcfittingsonline.com/2-x-1-sch-40-pvc-reducer-coupling-soc-429-249.html?country=US&matchtype=&network=u&device=c&adposition=&keyword=&gclid=Cj0KCQiAnb79BRDgARIsAOVbhRrCGBUKBehF0wUPb5URZr5si_-zwoHFZ8iZLQpFIvffzGAld_VzVVYaAs_rEALw_wcB>

3” x 2” PVC reducer

<https://www.pvcfittingsonline.com/3-x-2-dwv-pvc-reducer-fitting-d102-338.html>

Mouthpiece – 1-1/2” x 1” PVC reducer bushing

<https://pvcpipesupplies.com/1-1-2-x-1-bushing-s-437-211.html?gclid=Cj0KCQiAnb79BRDgARIsAOVbhRpMP-kfQnHpYIMD_ZXeSIV2dY4_p1DO8McYgi4gp347RdW4-gSNNS8aAiTtEALw_wcB>

SWITCHES

(2 x) roller switches SPST

(3 x) arcade style button switch

CONNECTORS

(2 x) 5-pin XLR male panel mount and connectors

(2 x) 5-pin XLR female panel mount and connectors

MISC

Arduino UNO project box with enough room for two to three 5-pin XLR panel mount connectors

(2 x) 5-pin DMX cable

*PVC pipe constructions will be joined by bolts and nuts. Switches and other various components will be hot glued. Most will have snug fit sizes.

SKILLS ALREADY KNOWN

I have personally built many projects using sch 40 PVC and wiring components to fit inside.

I know how to play the trumpet and know how the end product should aim to feel.

SKILLS TO BE LEARNED

Need further research on how to output MIDI bytes from Processing to the computer while maintaining serial communication from Arduino.

SIMILAR PROJECTS

https://hackaday.io/project/2992-the-open-woodwind-project

https://www.patchmanmusic.com/mdt.html

https://www.youtube.com/watch?v=A_tUe6-R26I&ab_channel=RyanEstes

PROJECTED CALENDAR

Week 1

11/16 – Project approval

11/17 – Order all necessary parts and begin researching midi communication from Processing

Week 2

11/23 – Have a working note on/off midi controller using tactile switches

11/24 – As parts arrive, begin construction of the midi trumpet

Week 3

11/30 – Have a working prototype of the breath controlled rolling switches and arcade valve keys

12/03 – Finish first construction of the midi trumpet and begin construction of the Arduino box

Week 4

12/07 – Have a complete working version of the midi trumpet, begin adding LED design (optional), final testing and improving the design

12/14 – Final delivery of the finished project