

# SYNTH UX HACKATHON 2024

MARCH 17 - 20TH

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## SCHEDULE

### anticipated

SUNDAY [ 10 AM - 3pm ]

- measuring pots & sensors
- design work
- coding in max
- moving onto arduino

MONDAY [ 730pm - 930pm ]

- soldering wires, finishing circuit
- laser cutting & painting enclosure

TUESDAY [ 10 AM - 3pm → 7pm ON ]

- assembly
- documentation

### actual

SUNDAY [ 9am - 3pm & 11pm - 12AM ]

- measuring pots & sensors
- design work

MONDAY [ 9 am - 9 pm ]

- laser cutting enclosure
- arduino coding
- soldered components

TUESDAY [ 9 am - 12am ]

- painting enclosure
- finishing circuit
- assembly
- documentation

### Prompt

**Virtual Human Connection** - "Explore the dynamics of human connection in the age of technology. Depict the intersection between virtual and physical connections, highlighting the challenges and opportunities.

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Our device turns the process of making music into a collaborative experience at a crossroads where people of different levels of proficiency in music can engage with each other. It broadens learning opportunities for those less knowledgeable in music production while creating new challenges for those who are more proficient by engaging with their capacity to think and act beyond their own capabilities. We hope to see music born out of a shared creativity and personality of different kinds of people, rather than just the output of a single individual.

# DESIGN WORK



INSPIRATION!

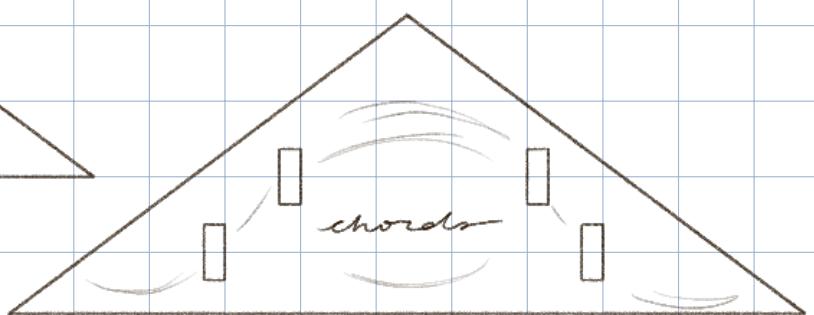
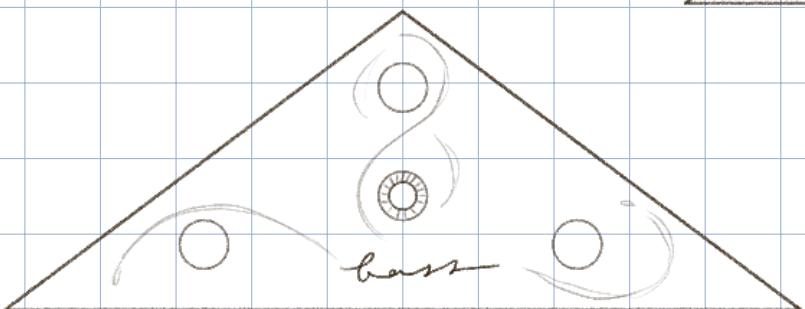
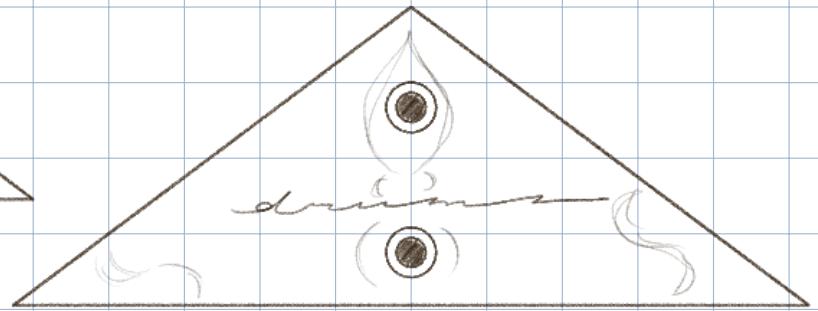
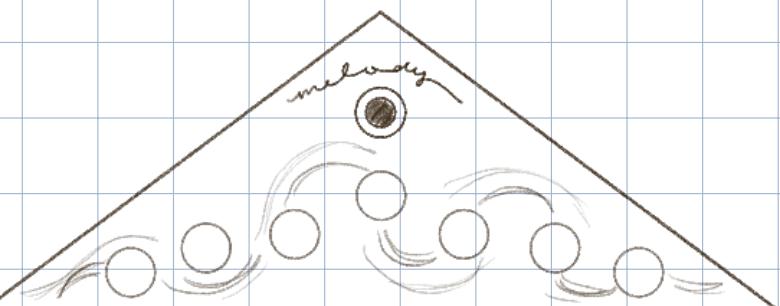
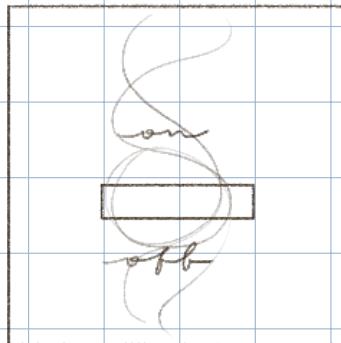
ARP/MELODY: joycon nunchuk, 7 buttons

CHORDS: 4 touch sensors

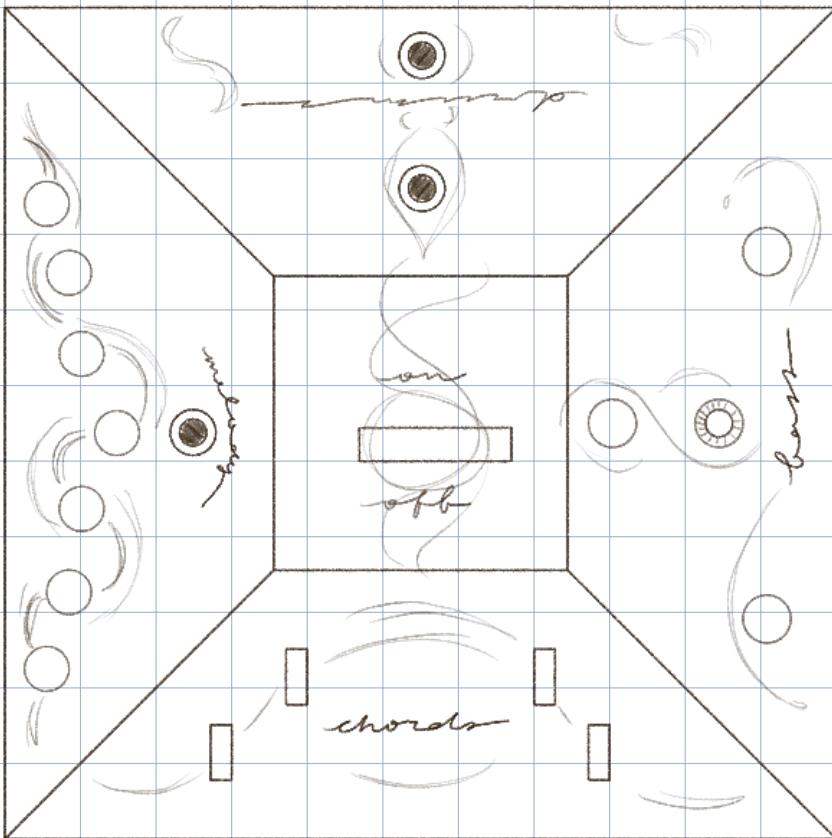
DRUMS: 2 joycons, 1 for kick & snare, 1 for hi-hat

WALKING BASS: 3 buttons, 1 pot

MOTHER CONTROLS: 1 sparkfun touch slider



### ANA'S LAYOUT



### mapping

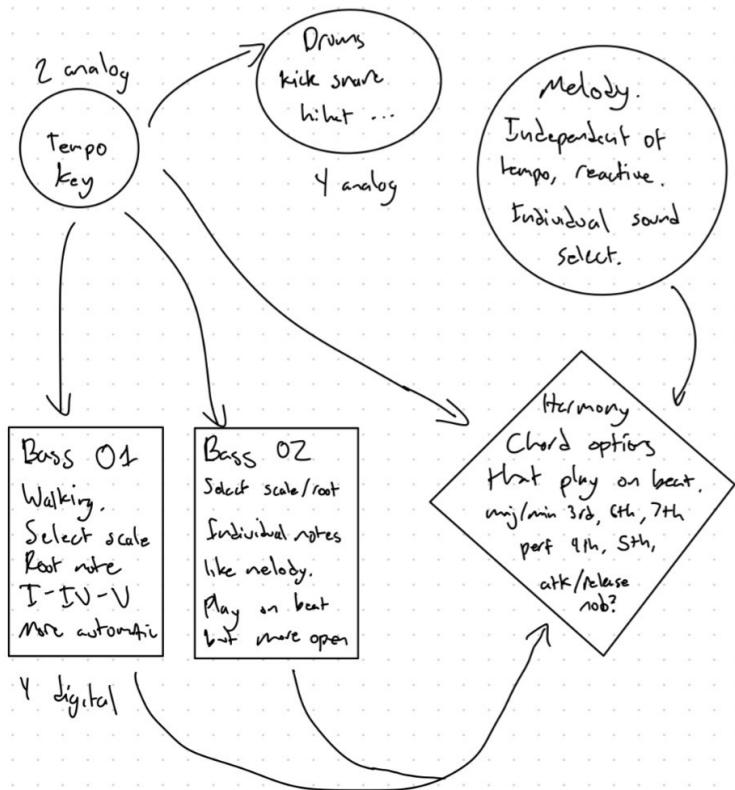


4 SIDED PYRAMID BASE

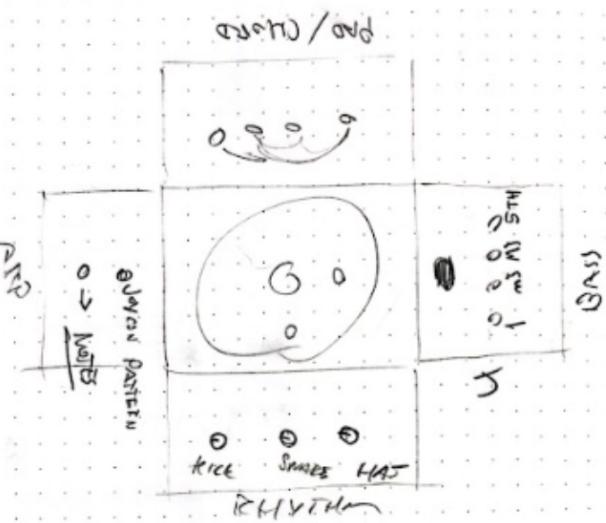


EACH SIDE CORRESPONDS  
TO DIFF PARTS OF  
MUSIC

### JOSH'S LAYOUT



### NICK'S LAYOUT

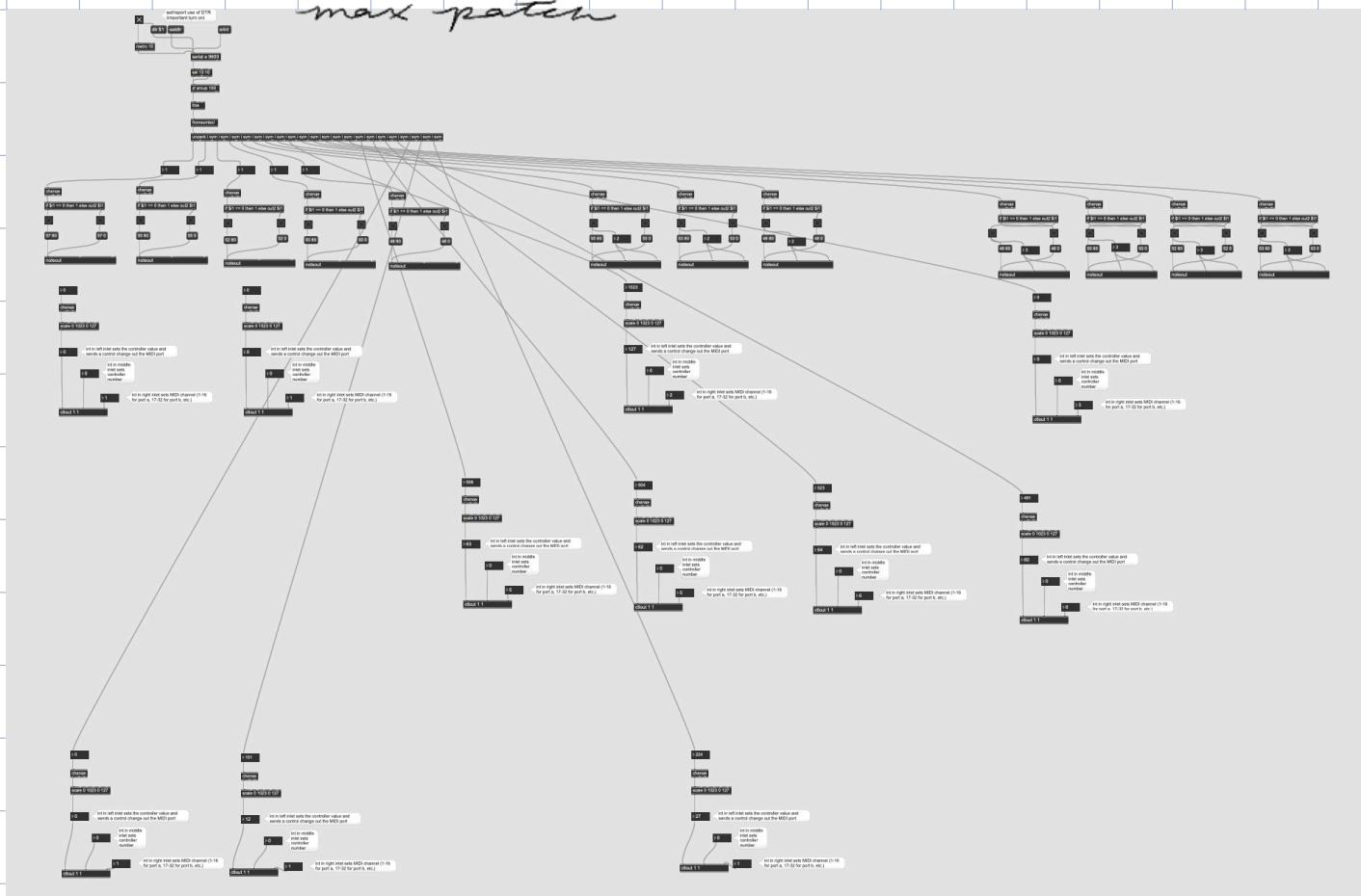


HARMONY 4 PADS TOUCH PADS  
DRUMS - 3 POT  
BASS - 3-4 BUTTONS  
ARP - 2 JOYERS

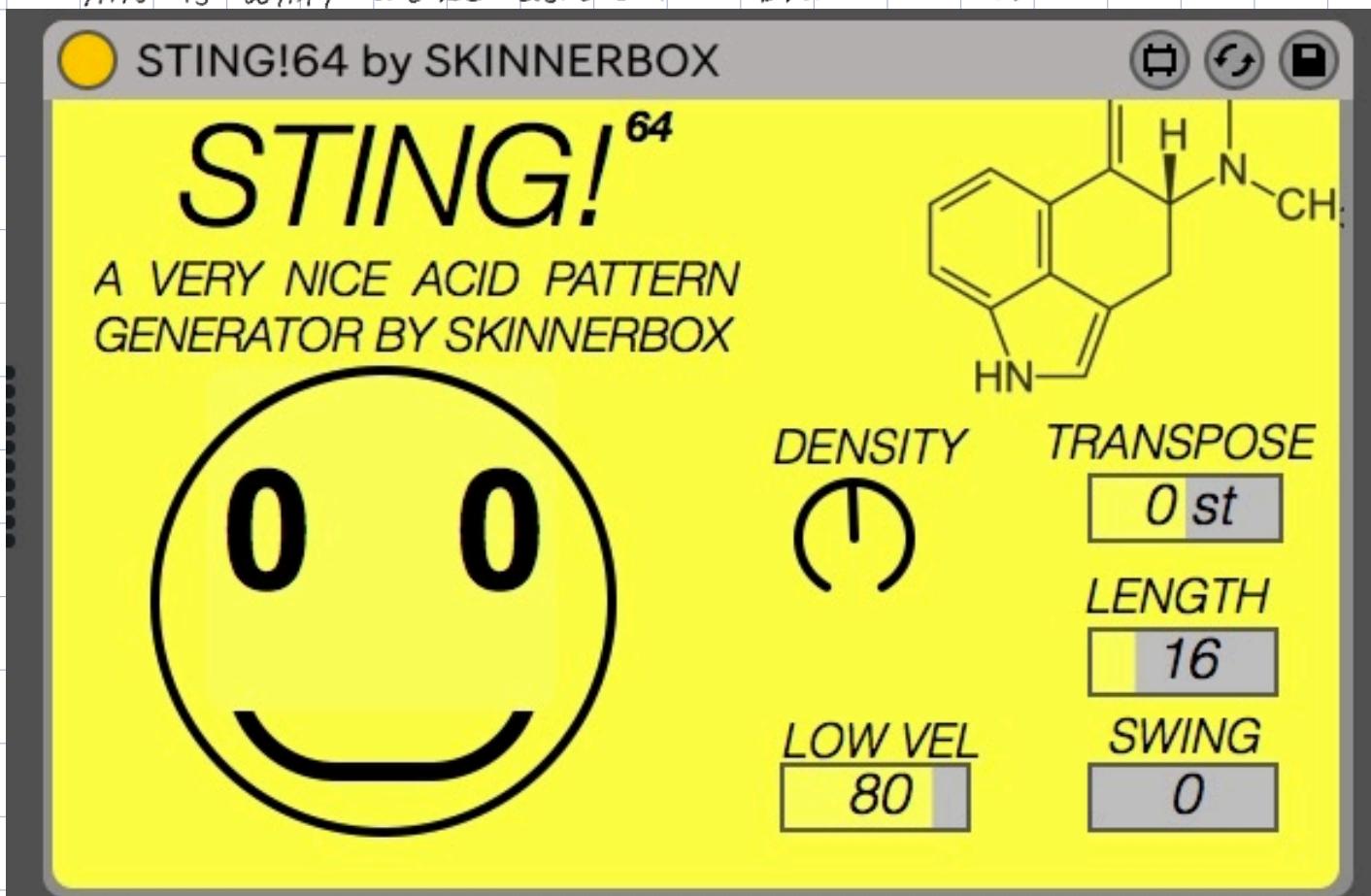
PARENT - 1 POTENTIOMETER (TEMPO)  
(FILTER)  
(PHASER)  
(REVERB / DELAY)

## SOFTWARE USED :

*max patch*



THIS IS WHAT WE'RE USING FOR DRUM GENERATION'



# SOFTWARE USED :

```
#include <MIDI.h>
#include <HC-SR04.h>

MIDI_CREATE_DEFAULT_INSTANCE();

int d1x, d1y, d2x, d2y;
int newd1x, newd1y, newd2x, newd2y;

UltraSonicDistanceSensor HC(15, 14);

void setup() {
    // put your setup code here, to run once:
    pinMode(A0, INPUT);
    pinMode(A1, INPUT);
    pinMode(3, INPUT_PULLUP);
    pinMode(4, INPUT_PULLUP);
    pinMode(5, INPUT_PULLUP);
    pinMode(6, INPUT_PULLUP);
    pinMode(7, INPUT_PULLUP);
    pinMode(8, INPUT_PULLUP);
    pinMode(22, INPUT_PULLUP);
    pinMode(23, INPUT_PULLUP);
    pinMode(24, INPUT_PULLUP);

    pinMode(50, INPUT);
    pinMode(51, INPUT);
    pinMode(52, INPUT);
    pinMode(53, INPUT);

    pinMode(A4, INPUT);
    pinMode(A5, INPUT);

    pinMode(A8, INPUT);
    pinMode(A9, INPUT);

    pinMode(34, INPUT);
    pinMode(35, INPUT);
    pinMode(36, INPUT);
}

Serial.begin(9600);
```

```
void loop() {
    // put your main code here, to run repeatedly:
    Serial.print(digitalRead(4)); Serial.print(",");
    Serial.print(digitalRead(5)); Serial.print(",");
    Serial.print(digitalRead(6)); Serial.print(",");
    Serial.print(digitalRead(7)); Serial.print(",");
    Serial.print(digitalRead(8)); Serial.print(",");
    Serial.print(digitalRead(22)); Serial.print(",");
    Serial.print(digitalRead(23)); Serial.print(",");
    Serial.print(digitalRead(24)); Serial.print(",");
    Serial.print(analogRead(A15)); Serial.print(",");
    Serial.print(digitalRead(50)); Serial.print(",");
    Serial.print(digitalRead(51)); Serial.print(",");
    Serial.print(digitalRead(52)); Serial.print(",");
    Serial.print(digitalRead(53)); Serial.print(",");
    Serial.print(analogRead(A3)); Serial.print(",");
    Serial.print(analogRead(A1));
    Serial.print(analogRead(A4));
    Serial.print(analogRead(A5));
    newd1x = analogRead(A6);
    newd1y = analogRead(A5);
    newd2x = analogRead(A6);
    newd2y = analogRead(A7);

    if (abs(d1x - newd1x) > 5) {
        d1x = newd1x;
    }
    if (abs(d1y - newd1y) > 5) {
        d1y = newd1y;
    }
    if (abs(d2x - newd2x) > 5) {
        d2x = newd2x;
    }
    if (abs(d2y - newd2y) > 5) {
        d2y = newd2y;
    }

    Serial.print(d1x); Serial.print(",");
    Serial.print(d1y); Serial.print(",");
    Serial.print(d2x); Serial.print(",");
    Serial.print(d2y); Serial.print(",");
    Serial.print(analogRead(A8)); Serial.print(",");
    Serial.print(analogRead(A9)); Serial.print(",");
    Serial.print(HC.measureDistanceCm());
    Serial.println();
    delay(200);
}
```

# PLOTTING OUT DIGITAL / ANALOG INPUTS:

ARDUINO MEGA:

8 ANALOG INS :

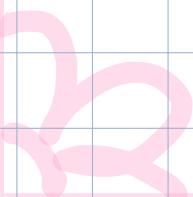
- 2 JOYCONS
- 4 POTENTIOMETERS

17 DIGITAL INS:

- 4 TOUCH BUTTONS
- 8 BUTTONS
- 1 SLIDER
- ULTRASONIC

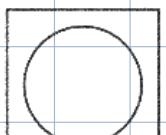
15 analog ins

50 digital ins



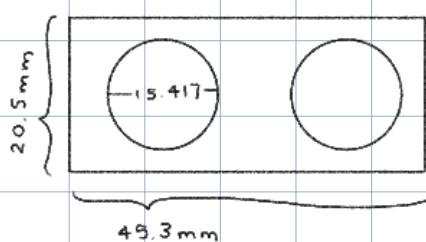
## measurements

JOYSTICK (DIAMETER)

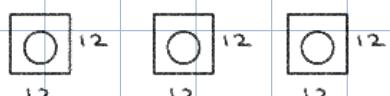


26.34 mm

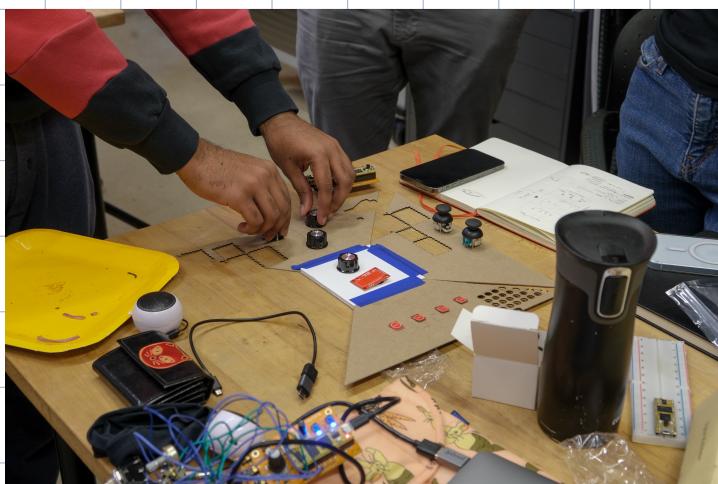
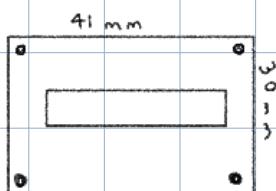
ULTRASONIC SENSOR (DISTANCE & DIAMETER)



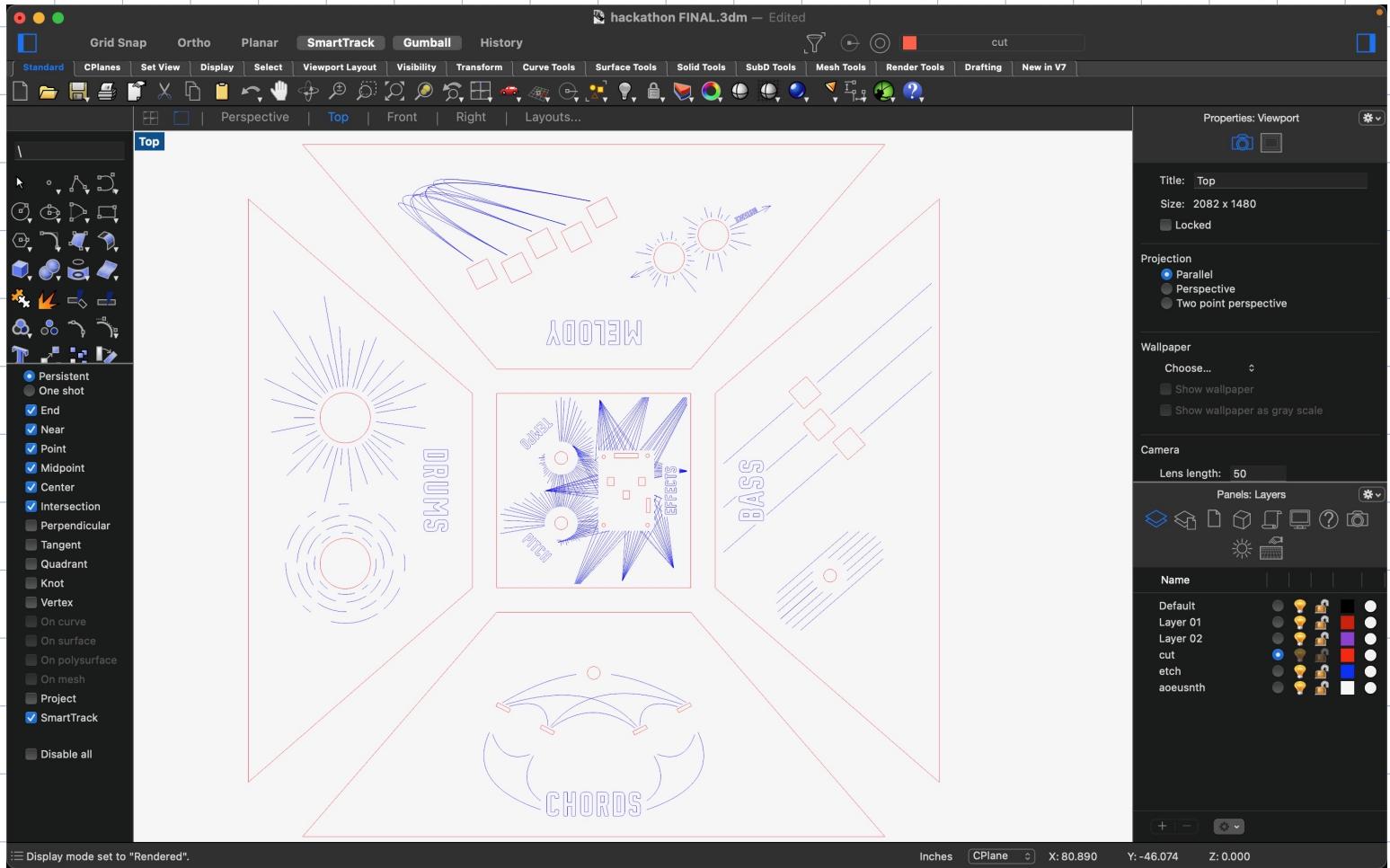
BUTTON (DIAMETER)



SPARKFUN SLIDER (WIDTH & HEIGHT)



# LASERING ENCLOSURE



## Chords:

11 possible simultaneous permutations:, 12, 13, 14, 23, 24, 34, 123

124, 134, 234, 1234

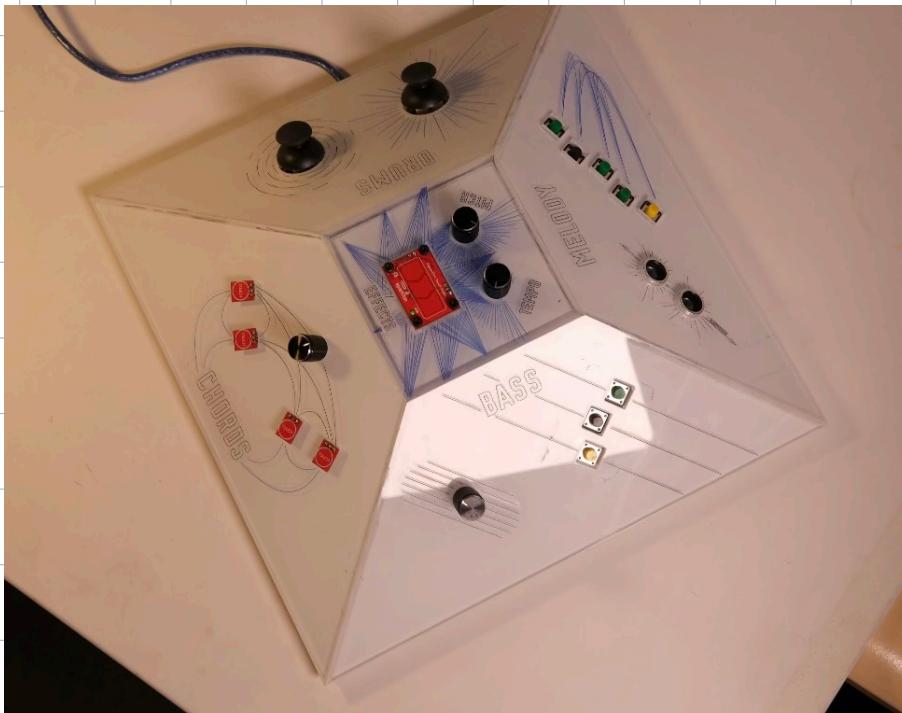
Chords that all sound good on top of Bass notes of 1st, 3rd, and 5th (in C)  
these are pretty

C Major (C-E-G) ; D minor (D-F-A) ; E minor (E-G-B)

F Major (F-A-C) ; G Major (G-B-D) ; A minor (A-C-E)

B diminished (B-D-F) ; C Major 7 (C-E-G-B) ; D minor 7 (D-F-A-C)

E minor 7 (E-G-B-D) ; F Major 7 (F-A-C-E)



Sign in



## Collaborator Demo and Documentation

