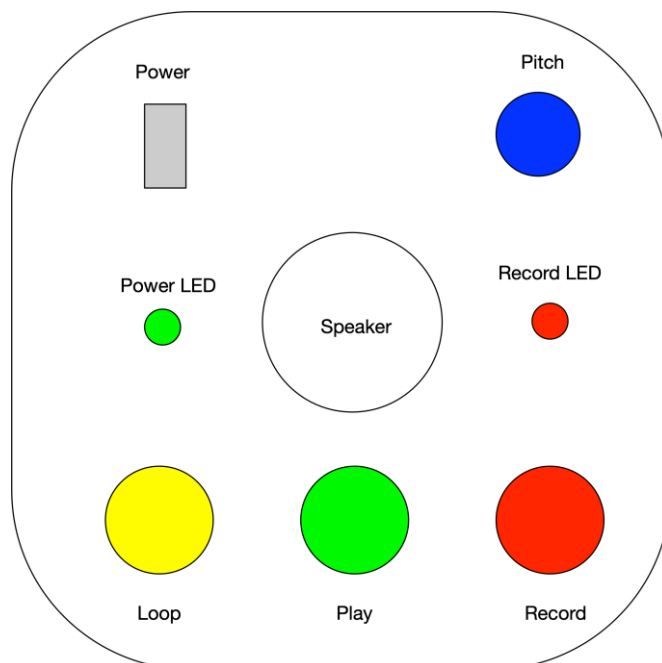


# LoFi Sampler - Assembly Guide



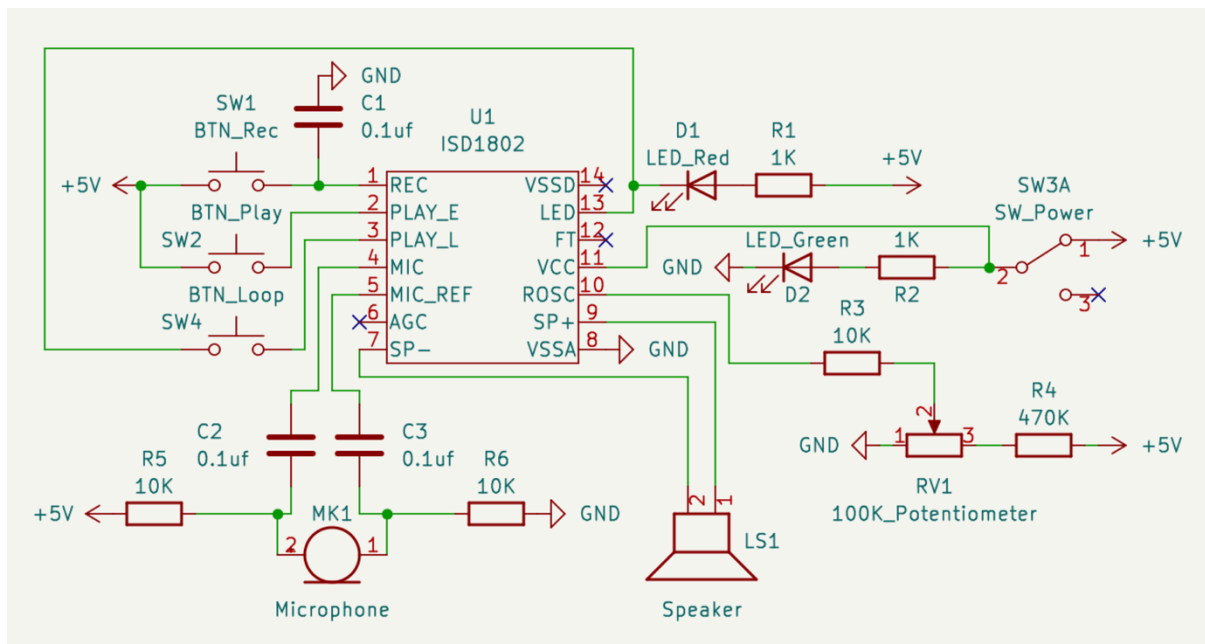
Interactive Media Lab, Griffith University, Brisbane, Australia

## Parts List

Collect all the parts you need:

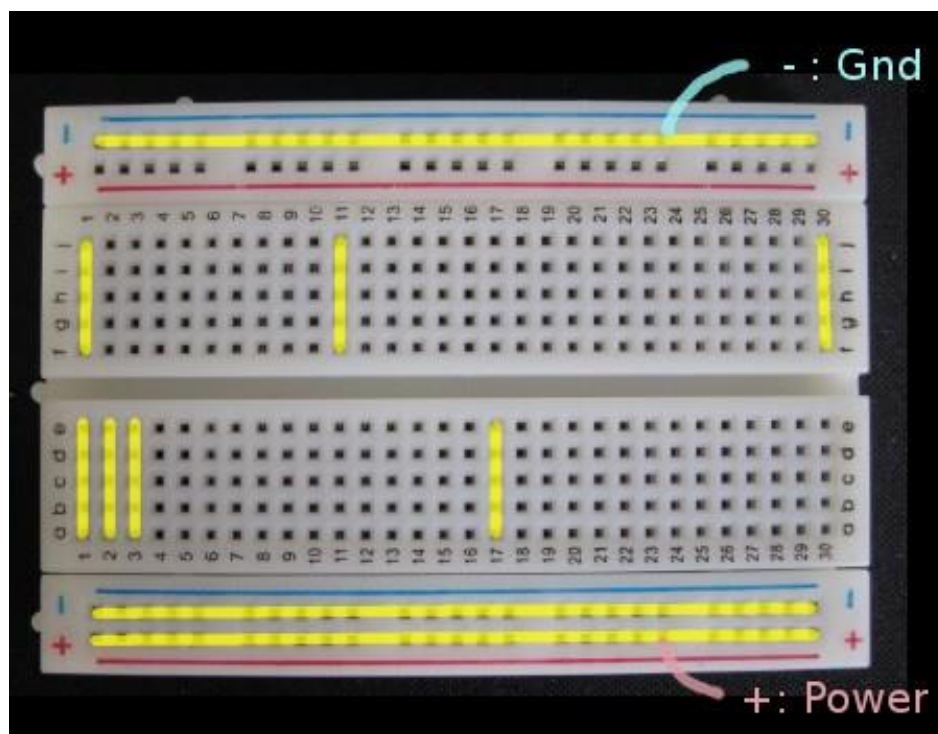
PART	QUANTITY	DETAILS
ISD1820 IC	1	
Buttons	3	Red, Yellow, Green
Potentiometer	1	plus nut & washer
Pot Cap	1	
Switch	1	
Microphone	1	
LEDs	2	Red, Green
Capacitors (Mic)	2	0.1uF (104)
Capacitor (Rec)	1	0.1uF
Capacitor (Power)	1	0.1uF
Resistors (LED)	2	1K
Resistor (Pot)	1	470k
Resistor (Pot)	1	10k
Resistors (Mic)	2	10k
Wooden top	1	
Wooden Bottom	1	
Wooden Sides	2	Two diff logos
Speaker	1	
Battery Case	1	
Batteries	3	AA
Screws (Speaker)	4	M3 4mm
Screws (Bat case)	2	M3 4mm
Rubber Feet	4	
Jumper Wires	5	

## Schematic



## Breadboard

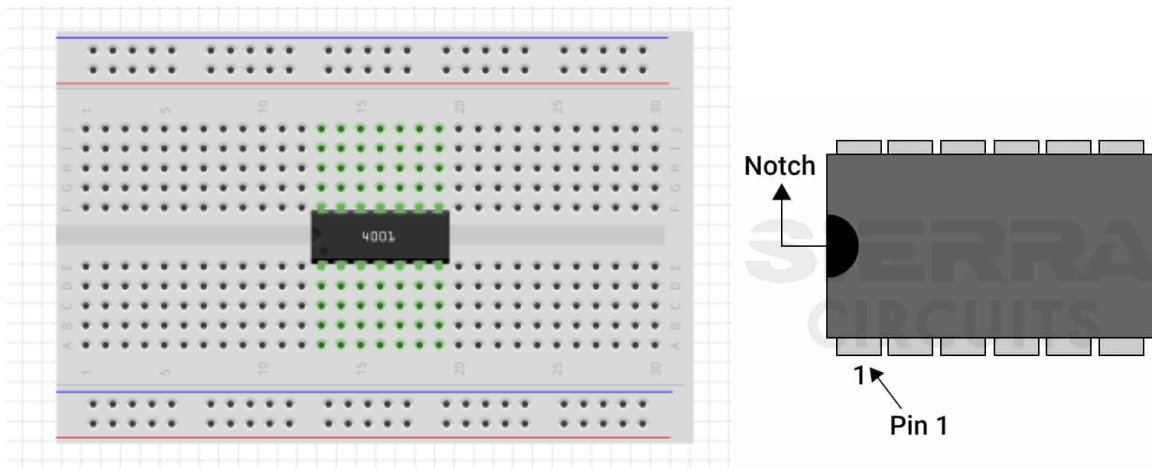
The electronic breadboard allows us to assemble components without soldering. Holes are connected within the inner columns and outside rows (rails) so that components inserted into the same column or rail are 'wired' together. The columns are divided into two sets by the 'gap' that runs down the centre of the breadboard.



## Assembly

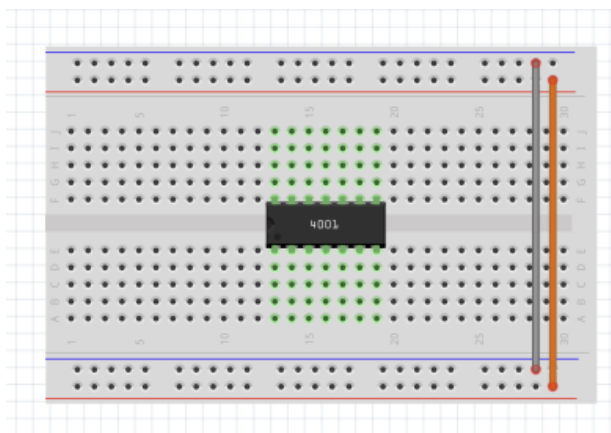
Place the ISD1820 in the middle of the breadboard, with legs on either side of the centre divider. Note the orientation of the chip, with the half-moon dimple being the 'top'. Make the top face left.

Numbering of pins are as shown in the schematic above. Pin 1 is top-left, pins count 1 to 7 down the left side then around the bottom and from 8 to 14 up the right side.

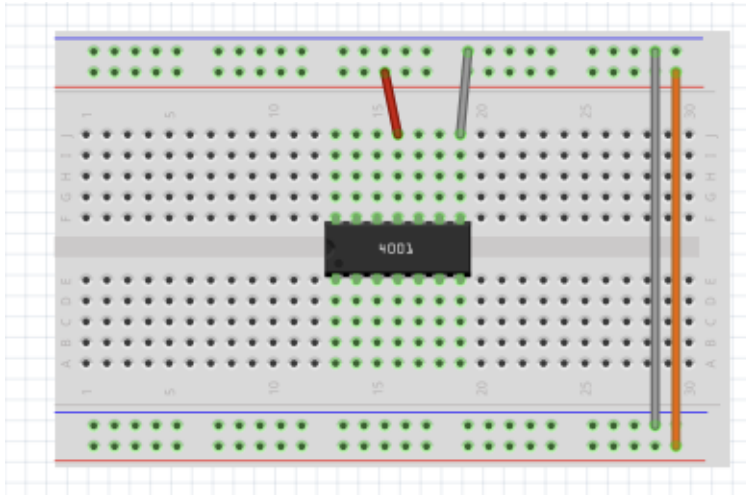


### Stage 1: Power

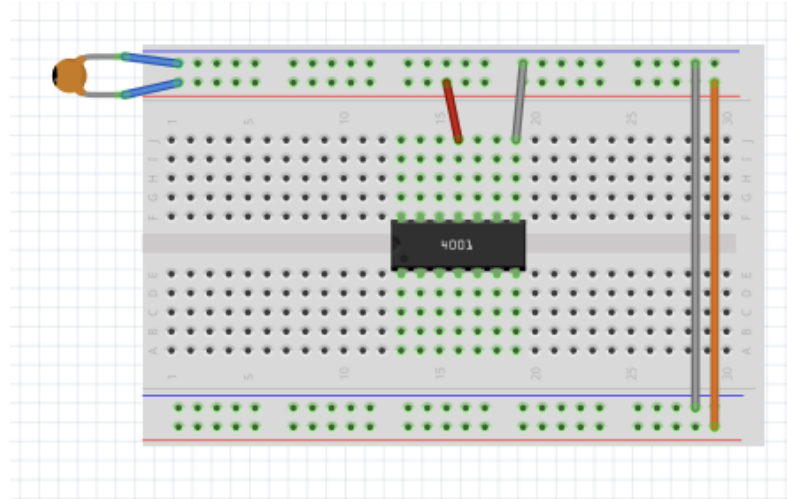
- Use jumper wires to connect the power and ground rails on either side of the breadboard.



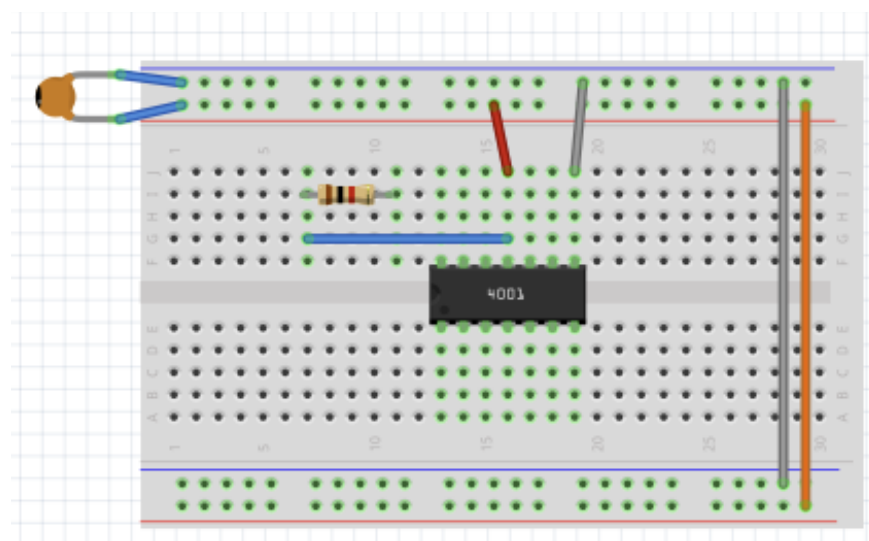
- Connect IC pin 8 to ground with jumper wire
- Connect IC pin 11 to positive with jumper wire



- Insert a Capacitor from the ground rail to the power rail.

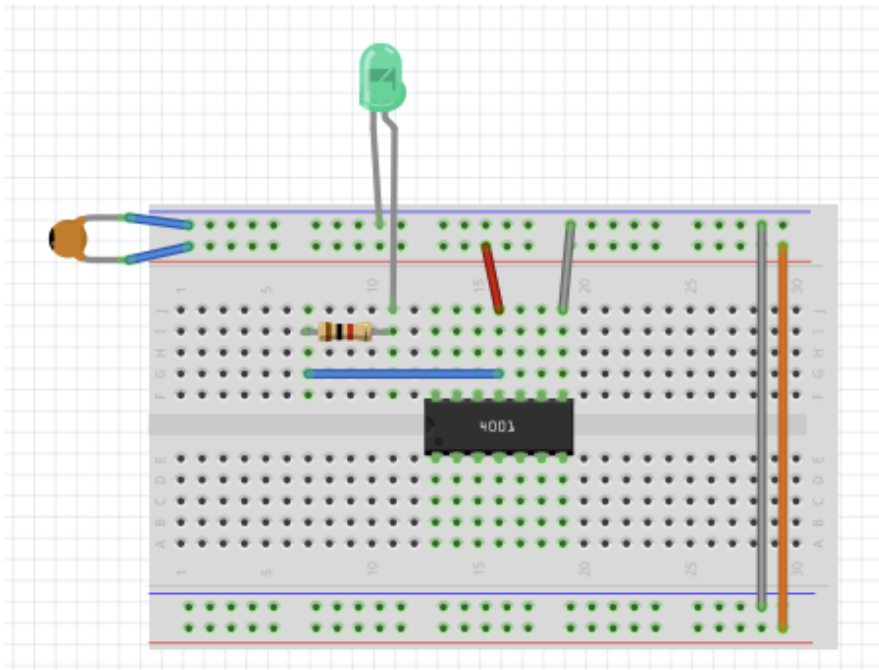


- Insert 1K resistor as shown
- Connect IC pin 11 to the far side of the resistor with jumper wire

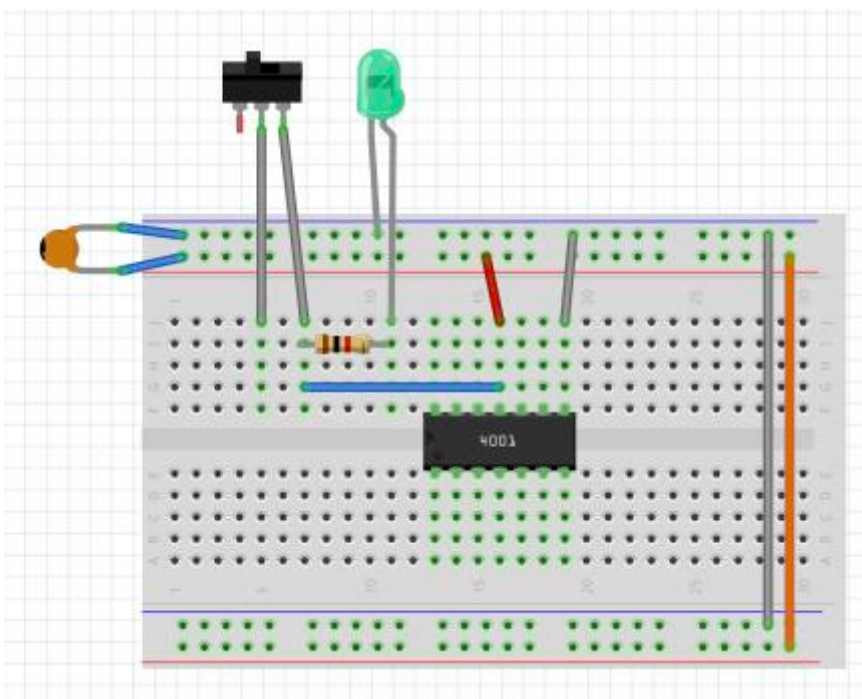


- Connect LED positive (long leg) to the near side of resistor

- Connect LED negative to the ground rail.

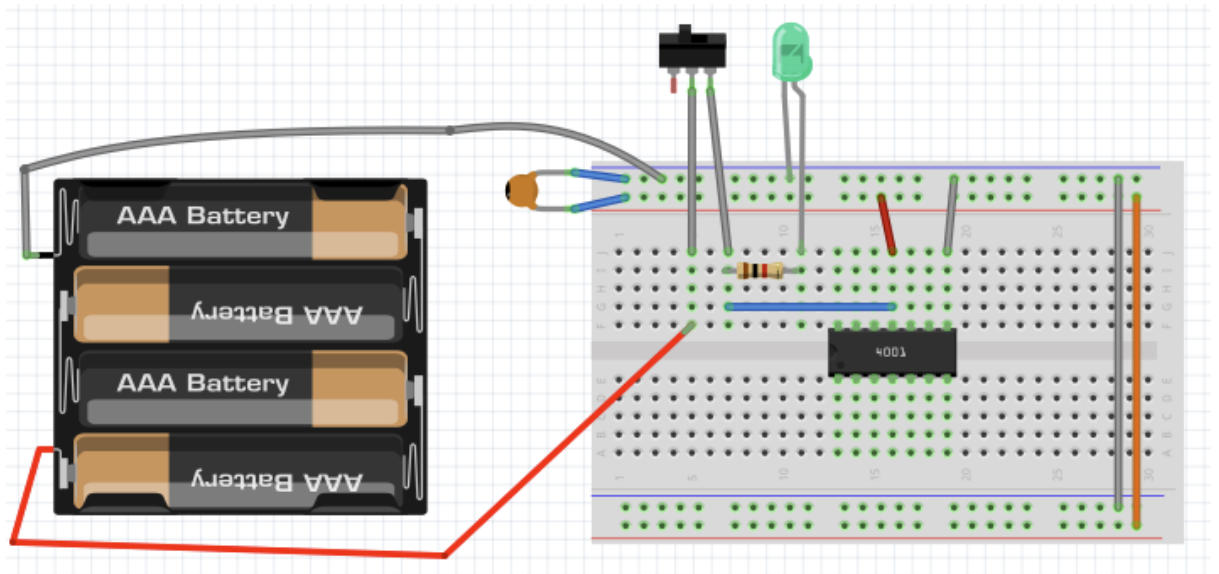


- Connect switch wires from far side of resistor and a vacant column.

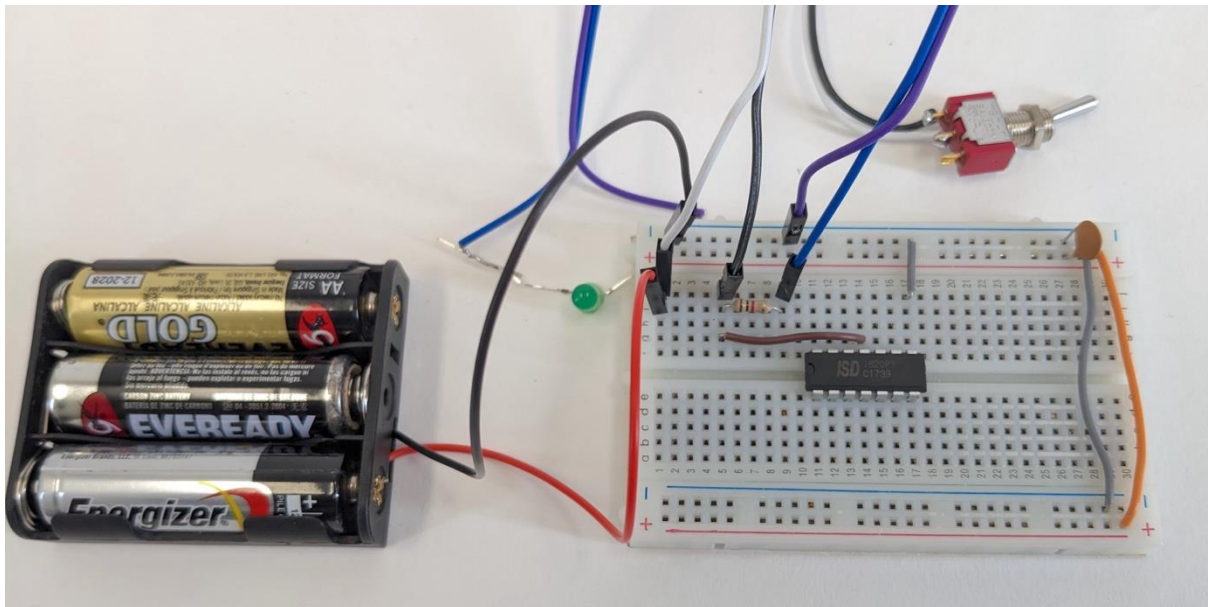


- Insert batteries in to the battery case and connect battery negative (black) to breadboard ground rail, and the positive (red) to the switch column.



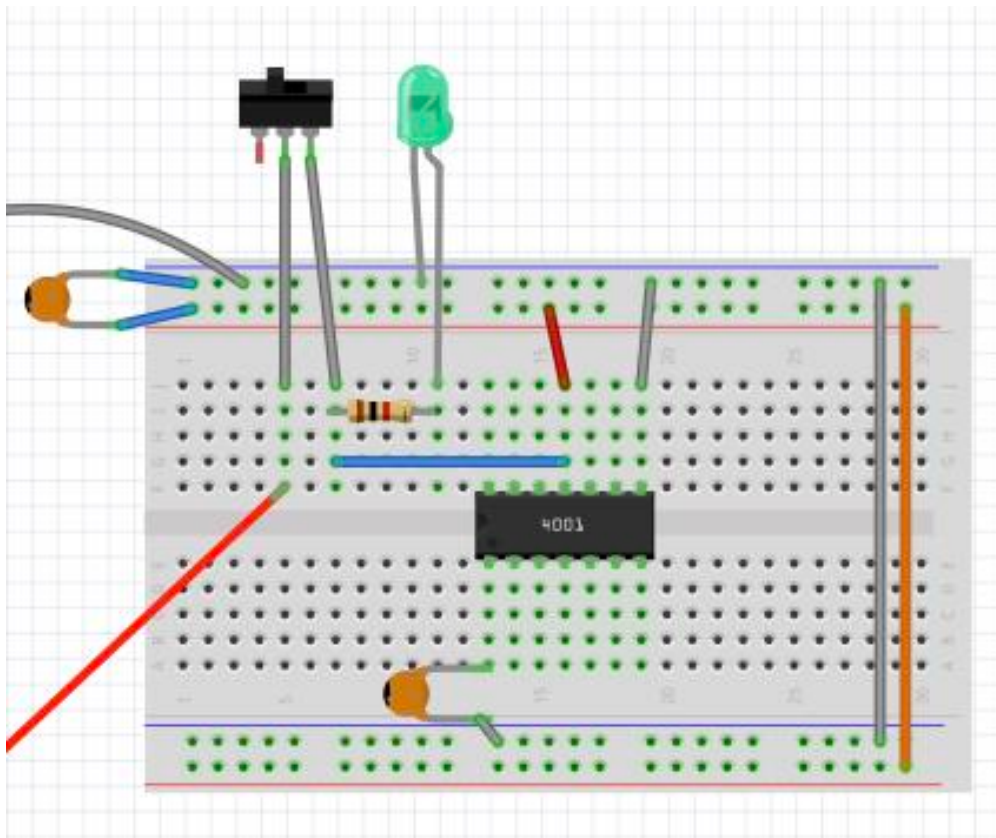


**Test:** Toggle power switch and the Green LED should turn on and off.

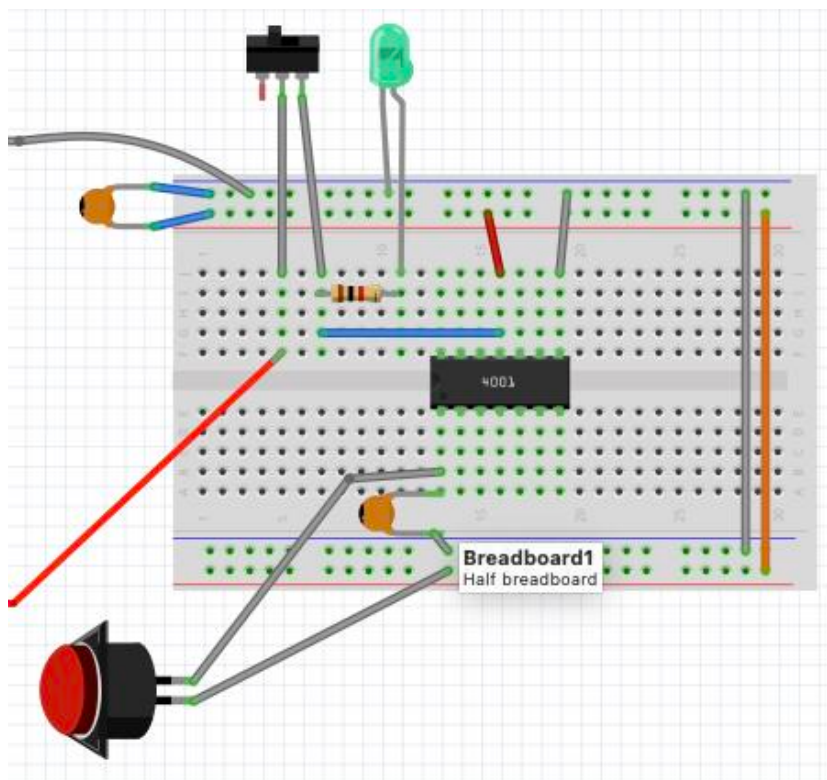


## Stage 2: Record Button

- Connect a capacitor from IC pin 1 to ground

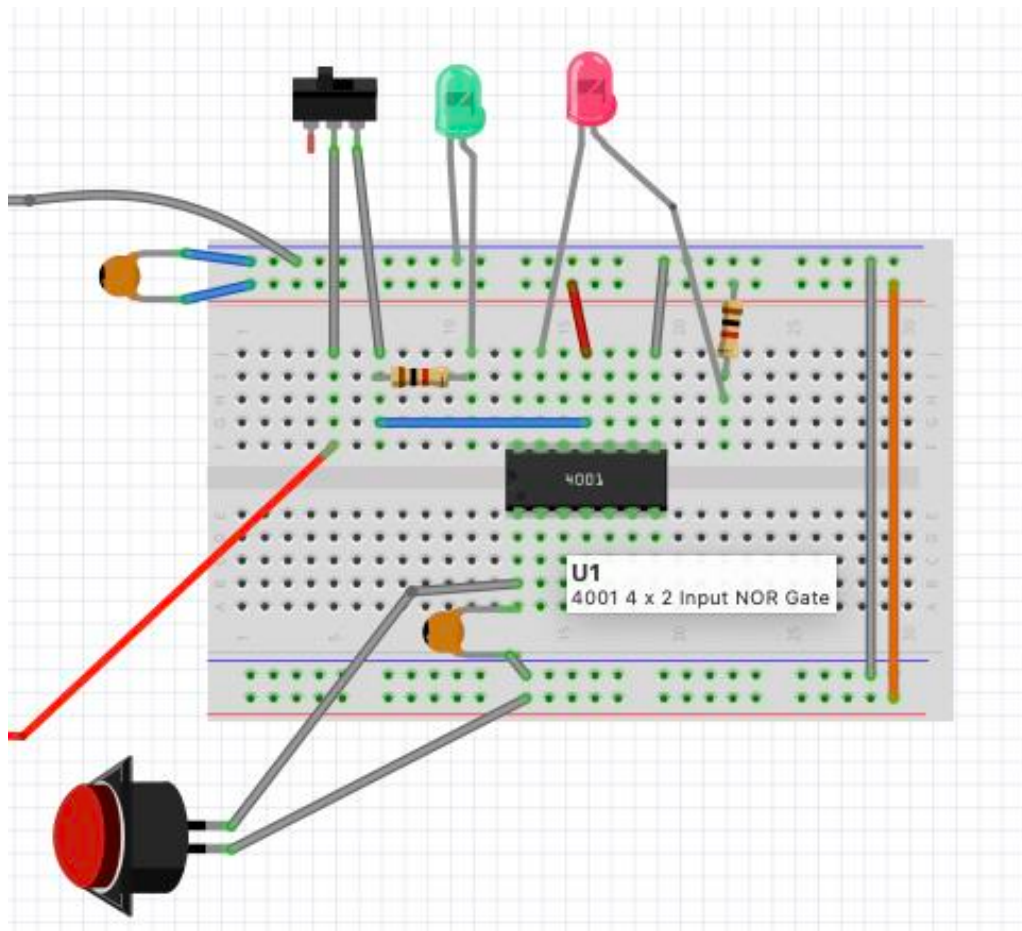


- Connect Red Button wires to IC Pin 1 and the power rail

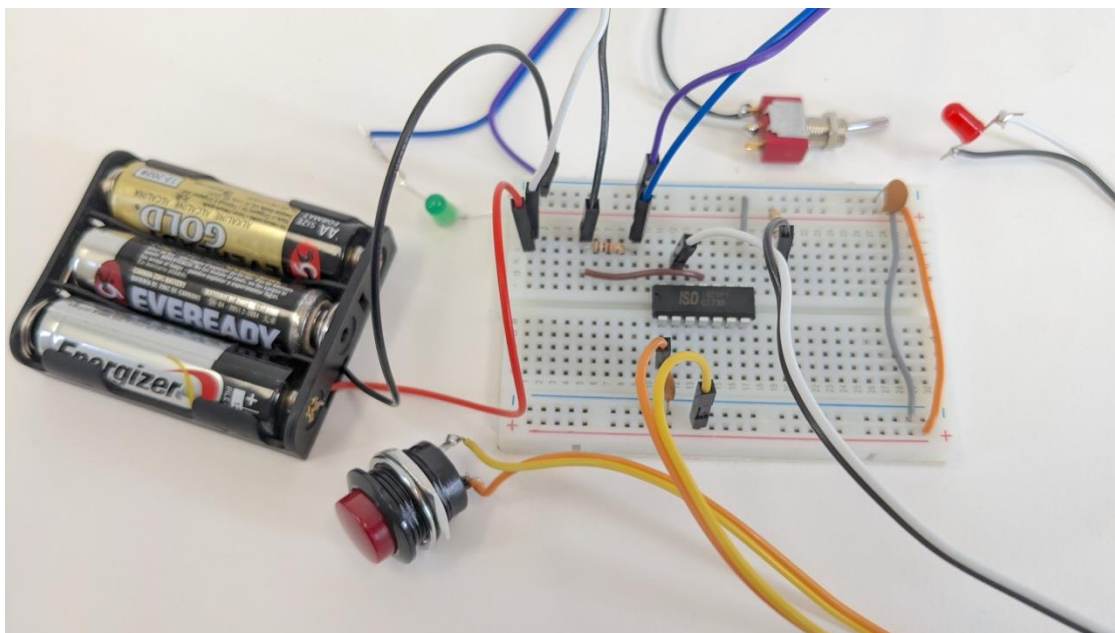




- Insert 1K resistor from power rail to empty breadboard column
- Connect Red LED positive (long leg) to resistor column and negative to IC Pin 13

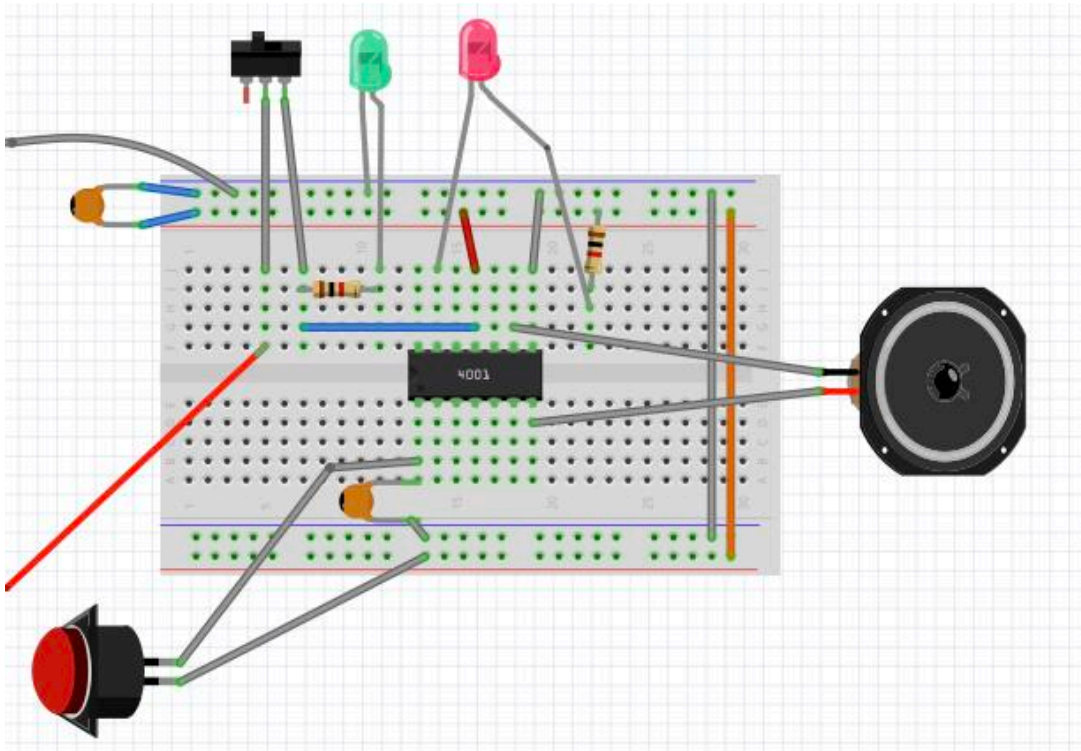


**Test:** Turn power on. Press the Red Button and the Red LED should light up.

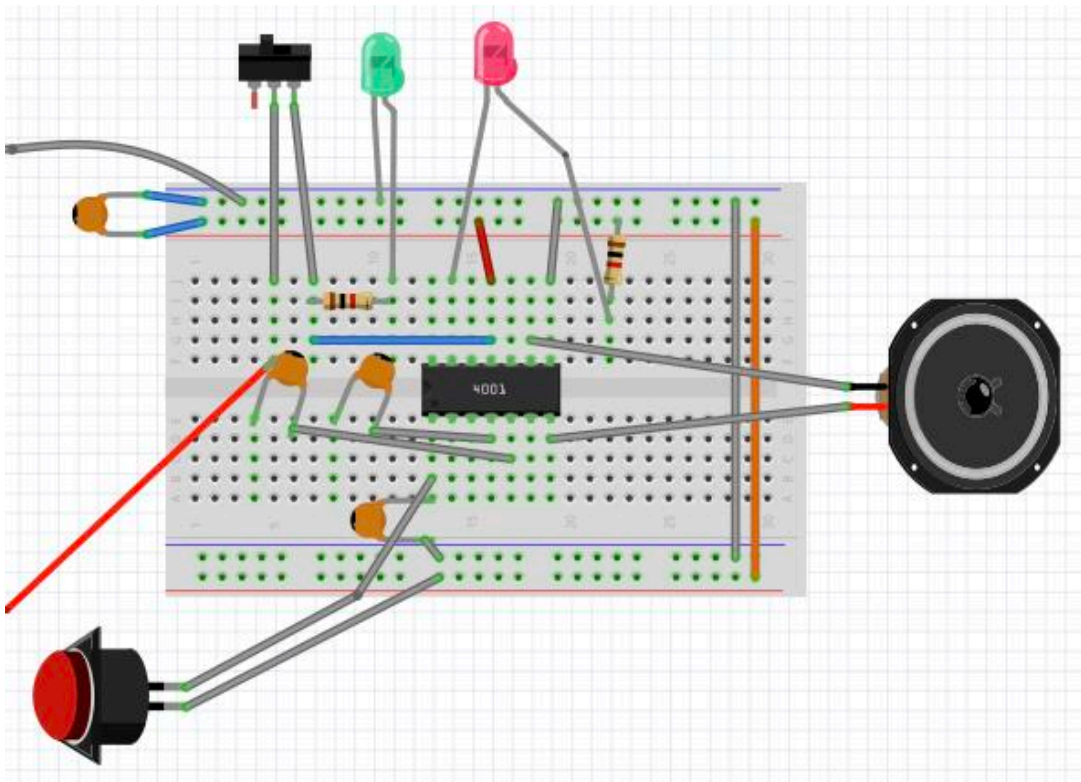


### Stage 3: Microphone and Speaker

- Connect the speaker wires to IC pins 7 and 9.

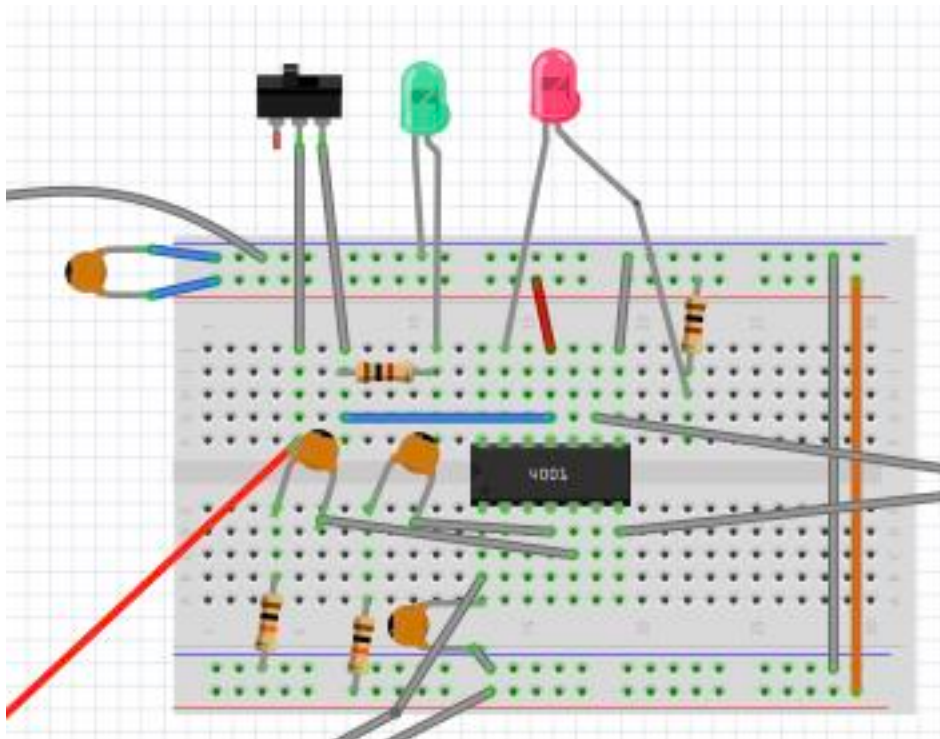


- Connect two capacitors, one from IC Pin 4 to a vacant column A and the other from IC Pin 5 to a different vacant column B.

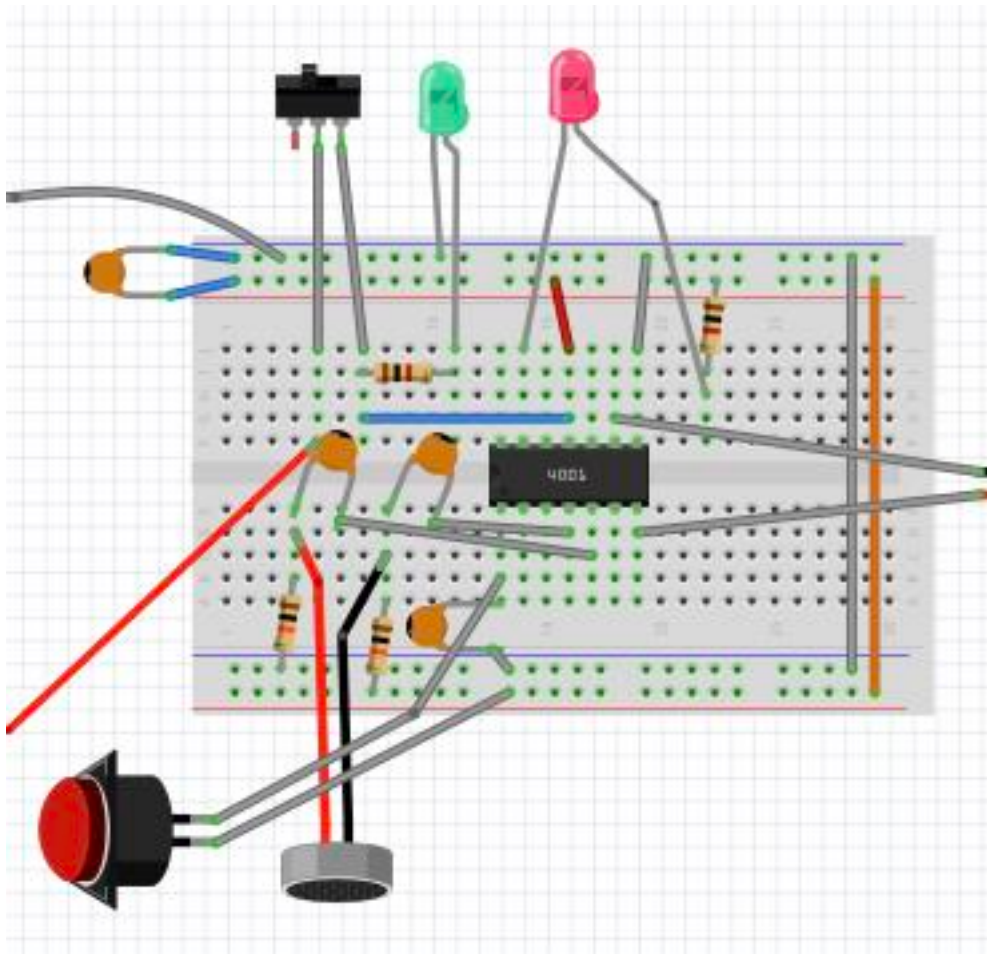




- Connect two 10K resistors, one from column A to the power rail, the other from column B to ground.

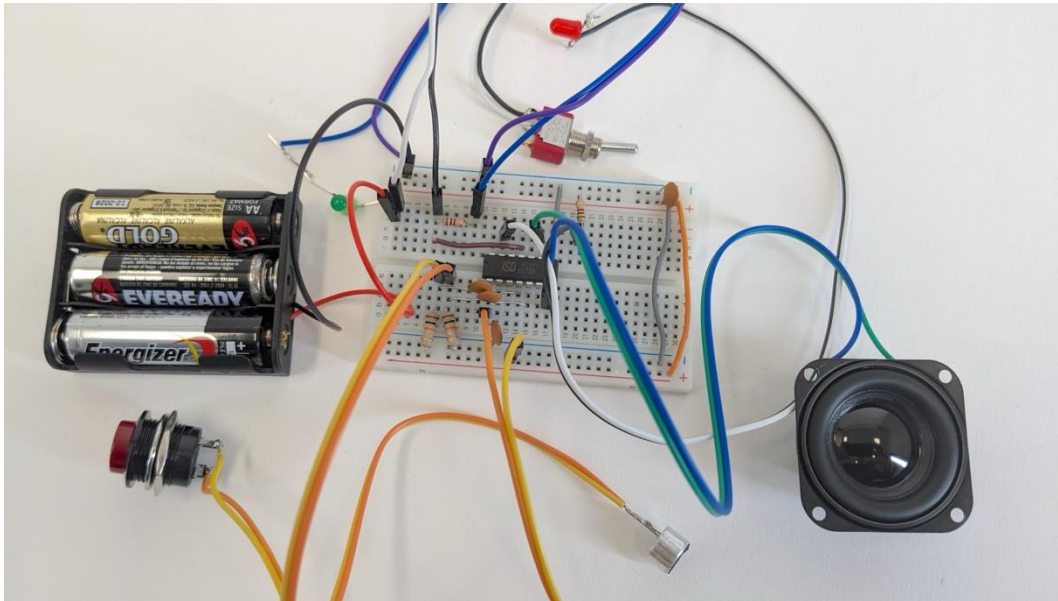


- Connect the two Microphone wires, one each to column A and B.



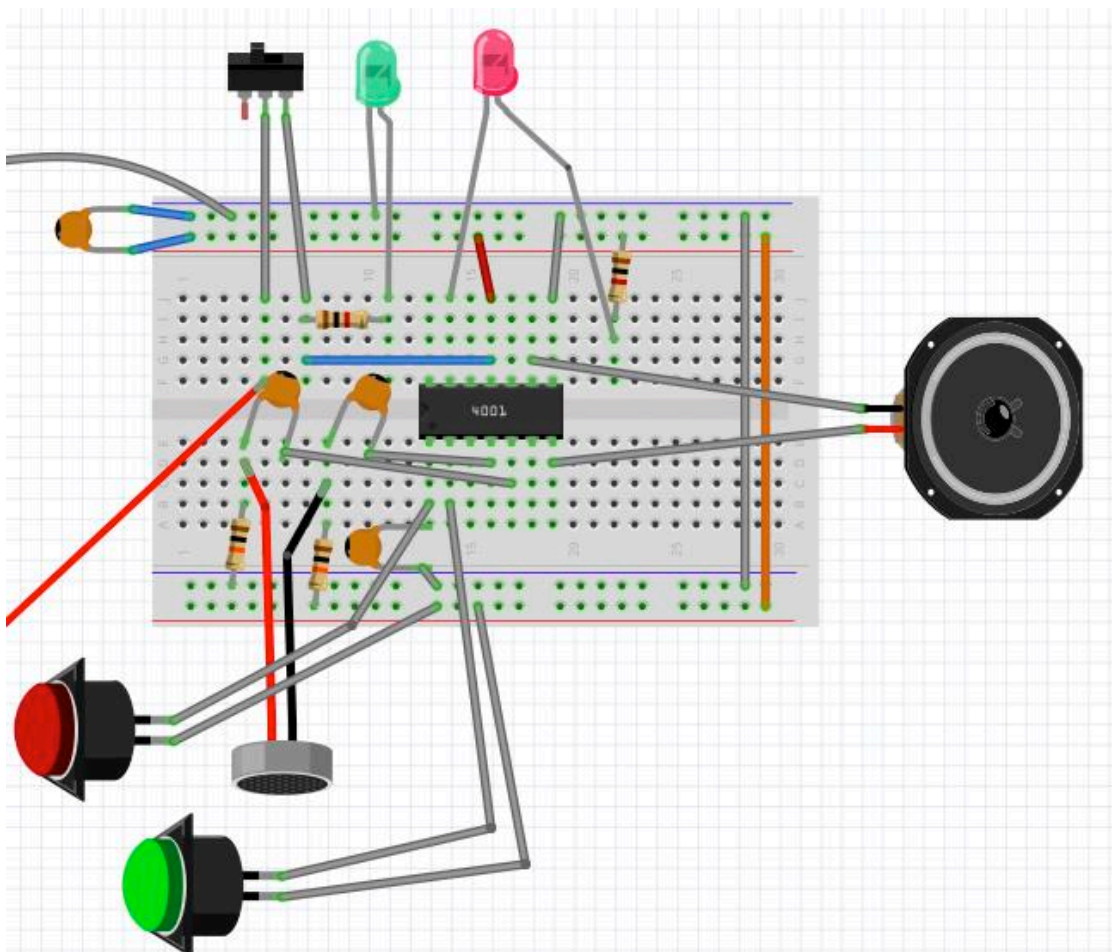
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Your build may look like this, at this stage.

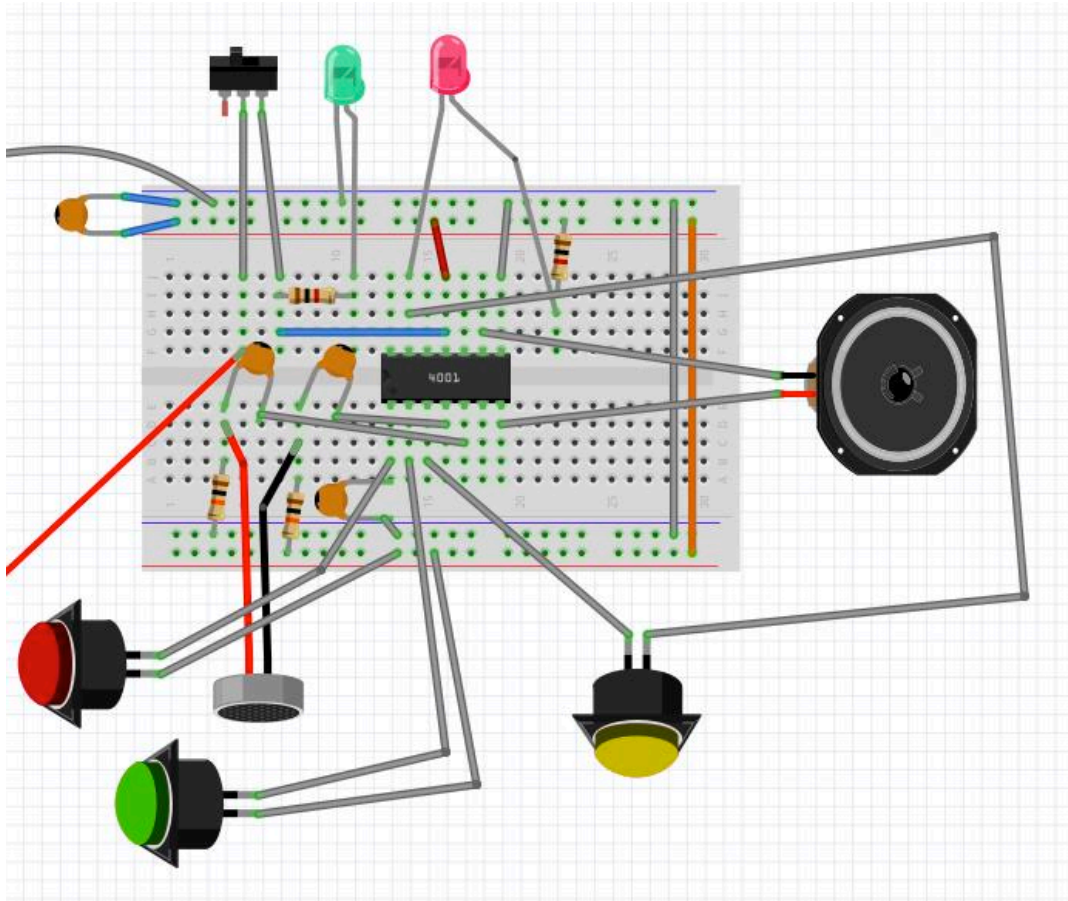


#### Stage 4: Playback Buttons and Potentiometer

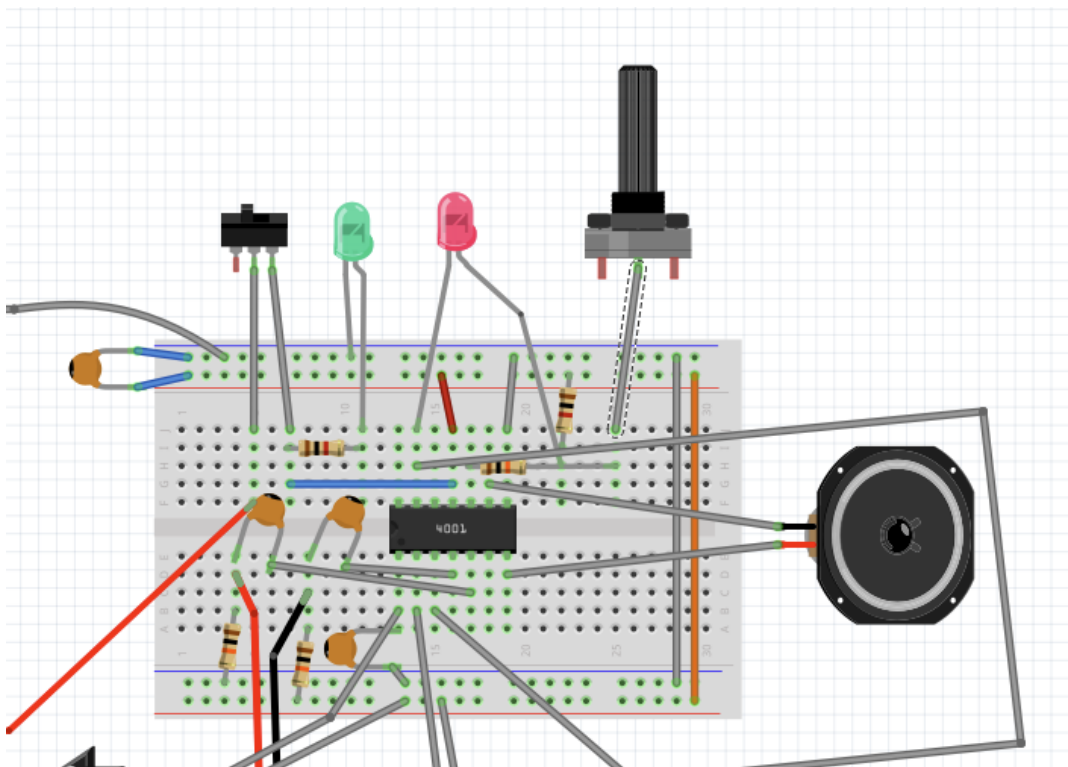
- Connect the Green Button (Play) wires to IC Pin 2 and the power rail.



- Connect the Yellow Button (Loop) wires to IC Pin 3 and IC Pin 13.

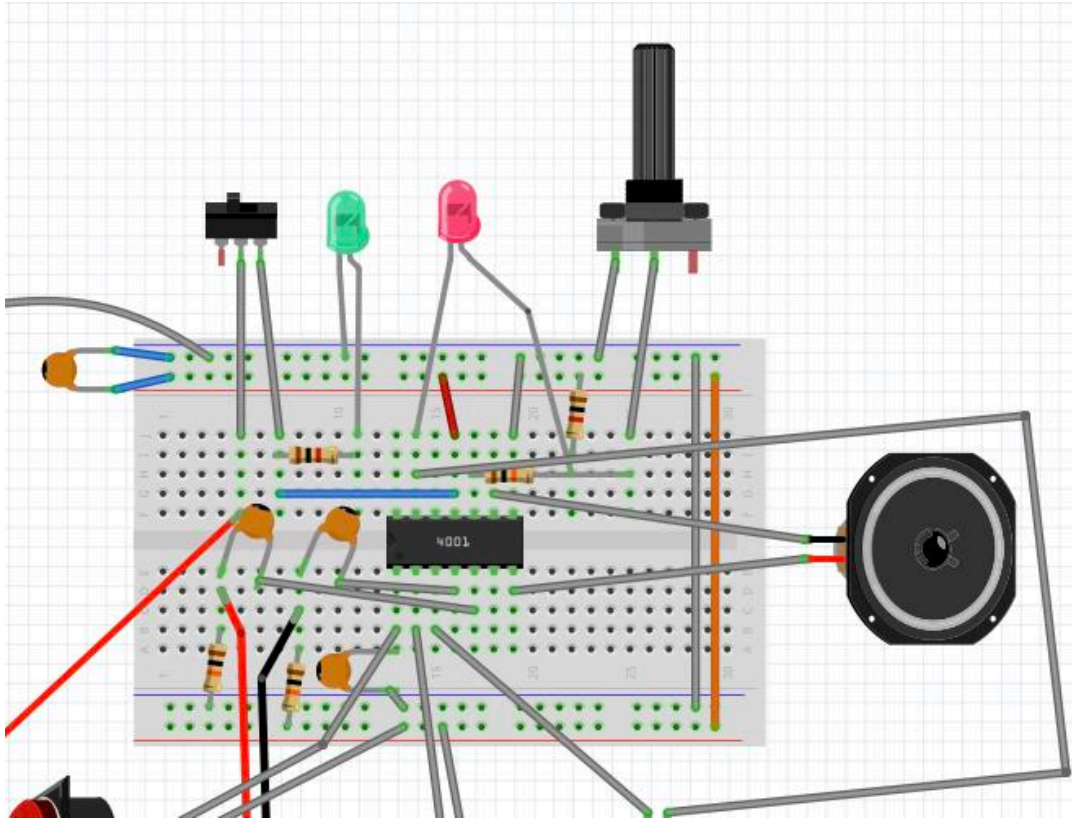


- Connect a 10K resistor from IC Pin 10 to a vacant breadboard column.
- Connect the centre wire of the potentiometer to the same column.

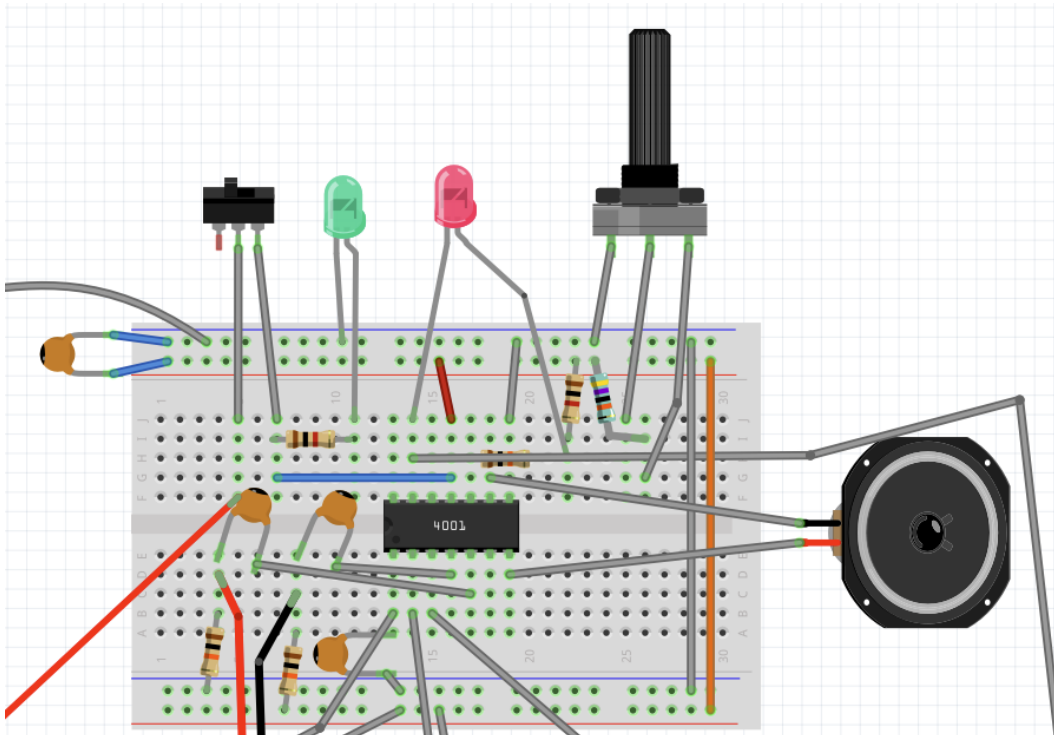


- Connect the right wire of the potentiometer to ground.

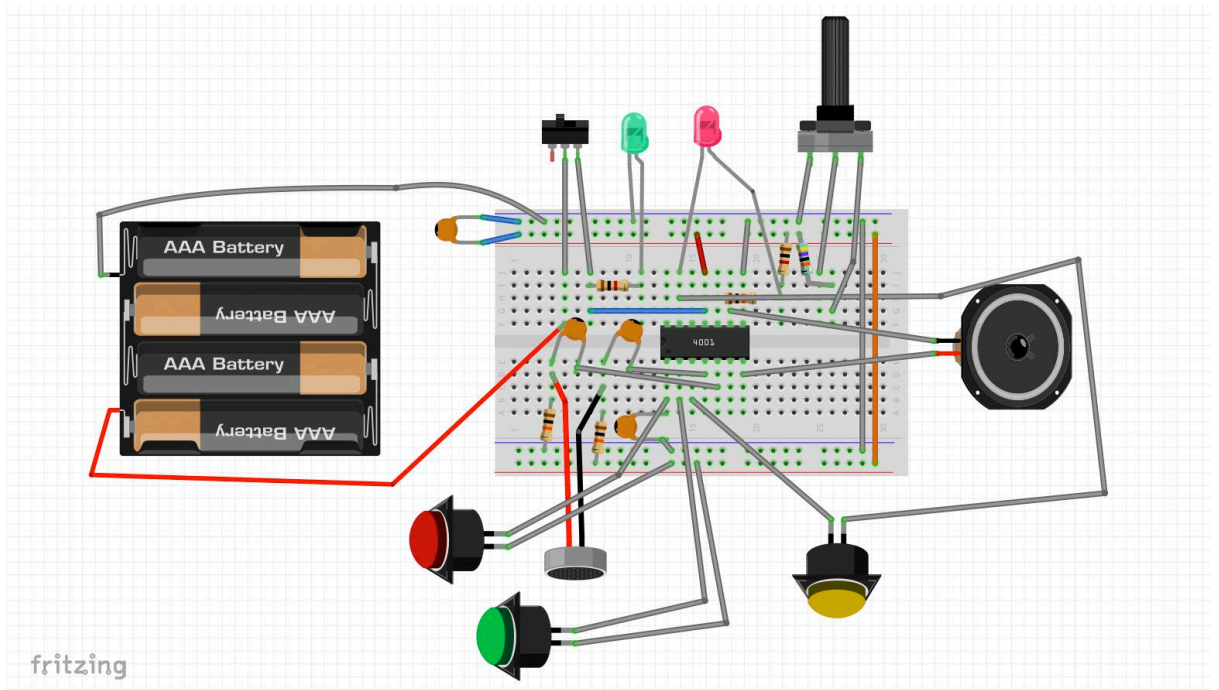




- Connect the 470K resistor from a vacant breadboard column to the power rail.
- Connect the left wire of the potentiometer to that column.



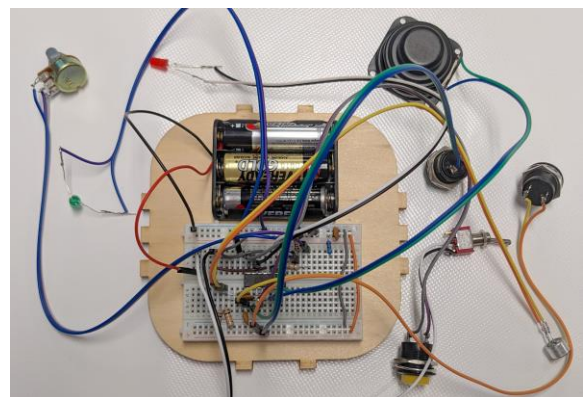
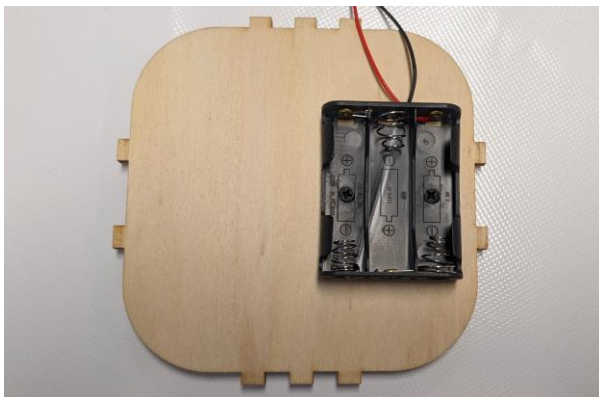
**Test:** Turn on power. Move the potentiometer to the middle of its range. Press and hold the Record (Red) button and make a noise into the microphone. Then press the Play (Green) or hold the Loop (Yellow) button – you should hear the recording played back.



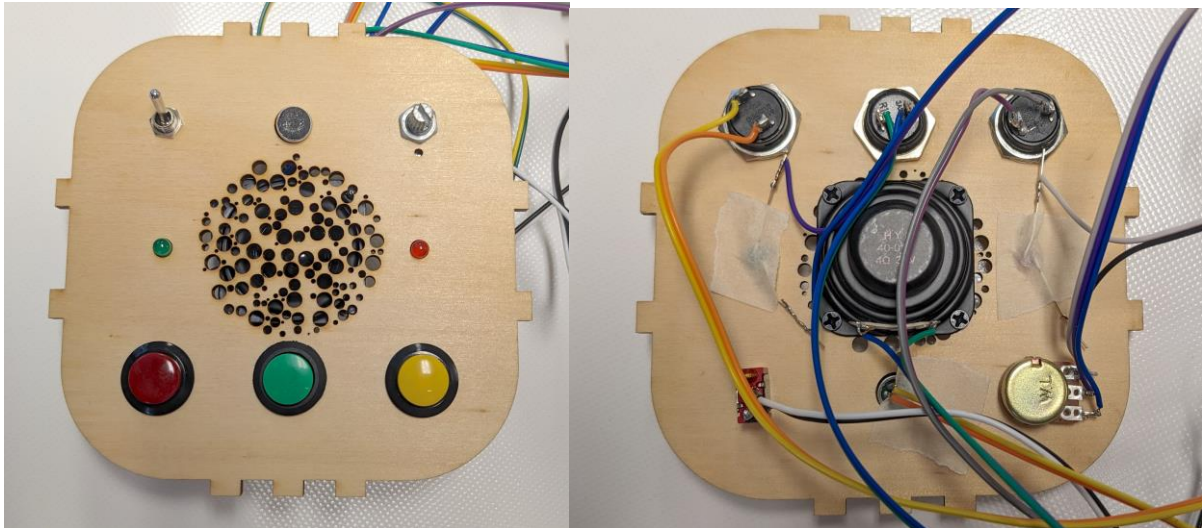
- Test the board to ensure that everything works as expected.
- Hot glue the Dupont pins to the breadboard to prevent them dislodging as the instrument is moved around.

### Stage 5: Connect components to the Back and Front Panels

- Screw the battery case to the baseplate of the enclosure. Re-insert the batteries.
- Peel off the protector from the bottom of the breadboard and stick the breadboard to the enclosure baseplate, next to the battery case.

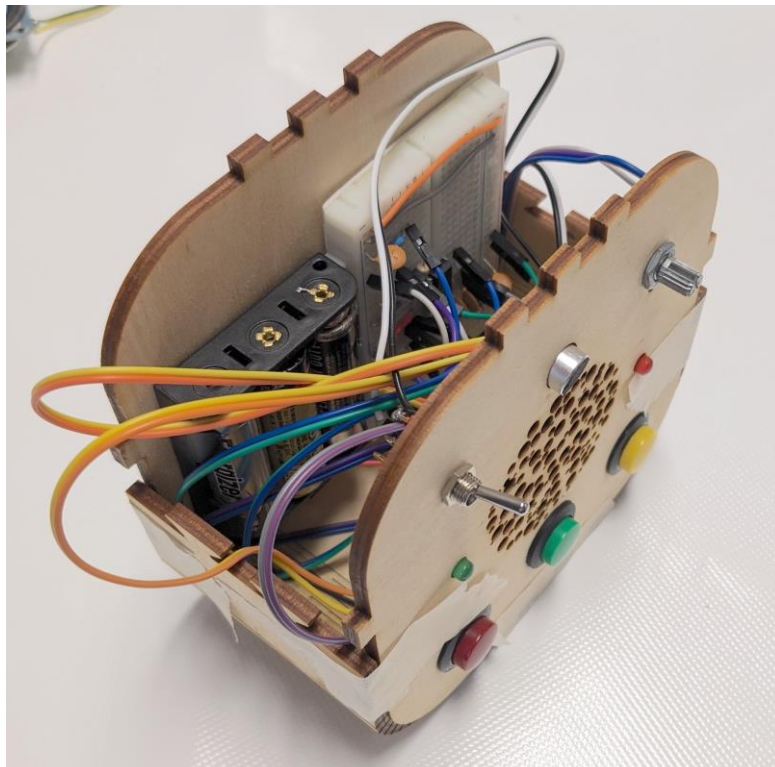


- Attach speaker, microphone, LEDs, buttons and switch to the top panel. Glue or tape LEDs and microphone in place.



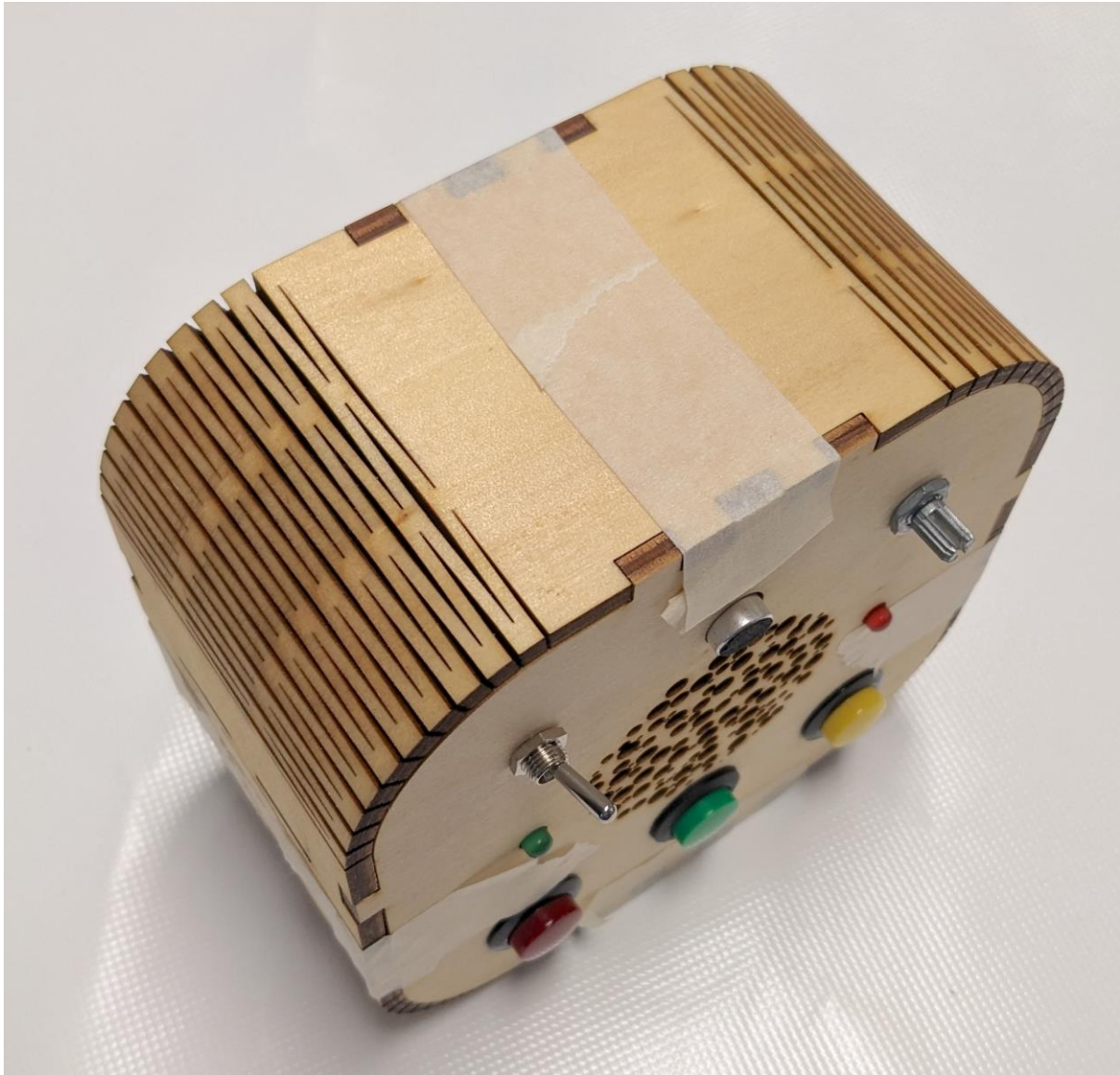
## Stage 6: Assemble the Enclosure

- Lay an enclosure side edge flat on the table and position the back and sides in place. Temporarily secure with masking tape or elastic bands to hold in place.
- Wrap one side of the living hinge up the side and secure in place, carefully ensuring the cables are tucked in neatly. Temporarily secure with masking tape or elastic bands to hold in place. Then do the same for the other side.



- Attach the second side, starting by position the centre and temporary securing.
- Wrap each side around and gently stretch the side joins into place. Note that there is a correct way to position the second side so the join types match up.





- Add the pot cap to the pitch control.
- Remove the temporary fastenings (tape or rubber bands). The box should hold together without gluing if handled gently. It is necessary to open one side of the enclosure, at least, to change batteries, but the other side could be glued for more strength.