DSL810 Project Proposal : Electronic Music Instrument

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Part A - Theremin

The theremin (/ˈθɛrəmɪn/; originally known as the ætherphone/etherphone, thereminophone or termenvox/thereminvox) is an electronic musical instrument controlled without physical contact by the thereminist (performer). It is named after its inventor, Léon Theremin (Лев Термен), who patented the device in 1928.

The instrument's controlling section usually consists of two metal antennas that sense the relative position of the thereminist's hands and control oscillators for frequency with one hand, and amplitude (volume) with the other. The electric signals from the theremin are amplified and sent to a loudspeaker.

Online Tutorials

https://www.youtube.com/watch?v=oRhO0MJll58&t=433s

https://www.youtube.com/watch?v=_FytVf5hH88

Components Needed

1x CD4093 NAND IC: http://rover.ebay.com/rover/1/711-532...
1x MCP602 OpAmp: http://rover.ebay.com/rover/1/711-532...
2x 100pF, 1x 1nF Capacitor: http://rover.ebay.com/rover/1/711-532...
1x 4.7µF Capacitor: http://rover.ebay.com/rover/1/711-532...
6x 10k, 1x 5.1k, 1x6.8k Resistor:
2x 10k Potentiometer: http://rover.ebay.com/rover/1/711-532...
1x Antenna: http://rover.ebay.com/rover/1/711-532...
1x Power Jack: http://rover.ebay.com/rover/1/711-532...
1x Audio Jack: http://rover.ebay.com/rover/1/711-532...
1x Housing: http://rover.ebay.com/rover/1/711-532...
Amazon.com:
1x CD4093 NAND IC: http://amzn.to/2ADFlcq
1x MCP602 OpAmp: http://amzn.to/2yvJ8aE
2x 100pF, 1x 1nF Capacitor: http://amzn.to/2yxlgSz
1x 4.7µF Capacitor: http://amzn.to/2AEY7jN
6x 10k, 1x 5.1k, 1x6.8k Resistor: http://amzn.to/2ywZ3VO
2x 10k Potentiometer: http://amzn.to/2i7rHXy
1x Antenna: http://amzn.to/2yvJkXq
1x Power Jack: http://amzn.to/2ytRnUn
1x Audio Jack: http://amzn.to/2ACKbqx
1x Housing: http://amzn.to/2ABhev8

Part B - Chlani Plate

Reference video -
https://www.youtube.com/watch?v=Q3oltpVa9fs

https://www.youtube.com/watch?v=hKmPc0Q0kKg

Components Needed

1. A large speaker

   I used an old 8" subwoofer - a standard speaker may also work but you'll probably end up needing to use higher frequencies than I used.

2. A computer to generate frequencies

   I used this free website - Online Tone Generator

3. An amplifier

   Any amplifier will do - you just need something that'll boost the audio signal from your

computer to power the large speaker. I used a guitar amplifier. It has a feature to take an aux-in and it worked perfectly. You may also need a 3.5mm audio cable to connect the two together.

4. Sheet Metal

   Mine is an 18" square. I had to cut it down to this size. The only sizes I could find at the hardware stores were 12" which would have been too small, or 24" which would have just been too heavy. Make sure the gauge steel is sturdy enough to stay straight when horizontal - you don't want it to sag or all the salt will simply fall off your plate.

5. Acrylic Sheet

   Usually called plexiglass, you'll have to cut this down to the correct size

6. Threaded rods, lock washers & nuts

   QTY 1 -

   12" long 1/4" threaded rod

   QTY 4 - 6" long 3/16" threaded rods

   QTY 2 - 1/4" nuts

   QTY 2 - 1/4" lock washers

   QTY 14 - 3/8" nuts

   QTY 8 - 3/8" lock washer

7. Table Salt

Part C - Musical Floppy Drive

Components Needed

1) Arduino - Ideally, you need the Arduino UNO but any Arduino would work. You just need to tweak something in the program with the pin assignments. In this mini-project however, I used Duemilanove. It works almost accurately as Arduino UNO and I didn't have to tweak anything.

2) Floppy Drives/Disks - Any floppy drive would work but it's a lot easier to use the 34-pin simply because it's common. Other than that, you would only be needing to determine 3 pins from your floppy. Pin assignments are available online, particularly here. Furthermore, I was trying to acquire a 5.25 floppy drive but to no avail, and ebay sells them around $20 so I said never mind about that. As a result, this project is composed only of the 3.25 floppy disk drives. You also need some floppy diskettes for this project.

3) Power Supply - Again, it depends on you. You can use any 5-volt power supply available but since an ATX power supply is just lying around at home, I conveniently used it instead.

4) CAT5 UTP Cable - Only because of the wires. I want my wires to be color-coded.

5) Breadboard - If you want a solderless-free project.

6) Soldering Iron/Lead - For soldering the pins you would need to connect your CAT5 UTP cable to, but if you still have the flat ribbon cable then good for you. Might as well use that to make it easier.

7) Cutter, Phillips/Flathead screwdrivers - For dismantling purposes.