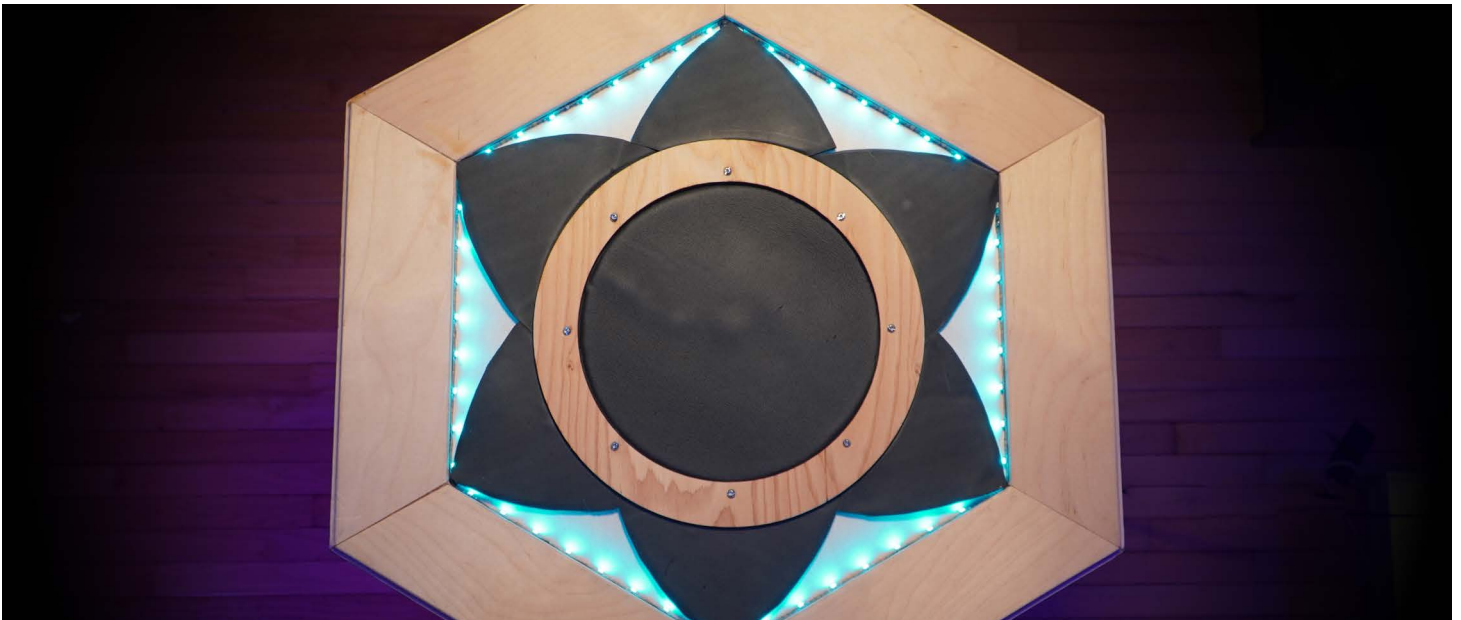


Appendix A - LD1100 - Roots

Concept

Link to video

LD1100 is a percussion instrument made mostly from reused materials that are commonly discarded by people. It presents an alternative direction and a protest to the wasteful disposal of resources. It demonstrates the amount of resources wasted by people and symbolizes a rebirth for these components and parts that found new purpose and a new life. The concept was to bring a set of components together and assemble them in a way that opens and disseminates seized knowledge. It is designed to be customizable, held on to perpetually and passed on to others rather than to waste. Besides the revival and repurpose of the components that make it, LD1100 is also designed to inspire and activate other makers to make their own versions through the disbursement of an instructions manual that shows the entire process of selection and fabrication.



Motivation

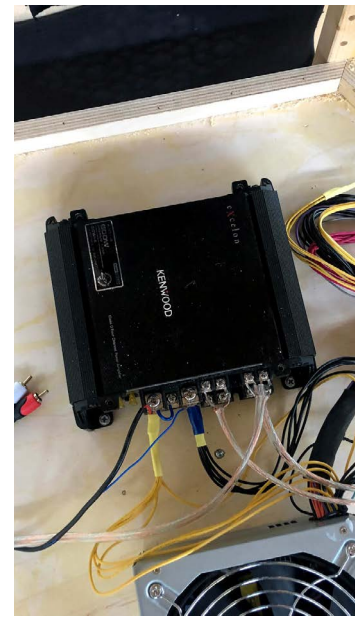
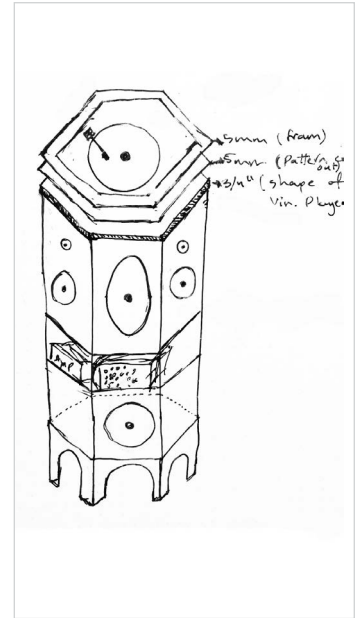
The motivation behind making LD1100 is observed through many aspects of making this device. First, I planned to create something that speaks to my background and culture in the Middle East visually and functionally. Second, I also aimed at creating an object that transcends commercial lifecycles and instead of depreciating in value and functions, it is preserved by the user and passed on with appreciation to its value.

Activation

The main goal of this thesis project is to achieve activation through demonstration, and by presenting this device and acknowledging its origins, I aim to activate and inspire the audience to adopt making as a way of life, and a tool against wasting resources. LD1100 achieves this by demonstrating a new purpose for its old components and a new acquired and shared knowledge by its maker.

Design

The design approach I used for this project is rapid prototyping. The process started with an inventory of available resources collected from donations, waste, and personal collection. After this step, prototypes were developed and tested for their functions and limitations. The process of prototyping fits perfectly with my background as maker and as a designer, since it brings both skills together in a productive way. For example, after developing a design brief and a list of materials and components available, I was then able to build prototypes that respond to these criteria and assess their success. Aesthetically, I was focused on creating a design that speaks to my culture and represents timelessness for the object. Essentially, I aimed for a design that does not lead the instrument to waste after a certain time period, but rather grows with the user and adapt to future functions the user might add. This is the reason I chose for this object to resemble traditional furniture common in a home in the Levant, the coffee table. This coffee table represents a different era in our culture and tends to be passed on from one generation to the next, gaining sentimental value and presence.



Repurposed materials

Since this experiment is based on objects received from donations or collected from trash, I was limited to the materials available to me. Also, since this object aims to respond to the rising e-waste levels among other things, the materials I choose to work with had to be considered from an environmental standpoint. So, after considering the materials available to me, I decided wood is safe and available in most homes. Also, wood is a highly reusable material that can be readapted for any new purposes fairly easily.

The wooden structure that holds the sculpture together is from a broken cabinet, cut and modified to fit this new purpose. While this might not be the easiest way to acquire and work with wood, it does however, reduce waste and activate reuse. In addition to the structure, the outer panels are wooden floorings that are also commonly available in homes and can be found and reused relatively easily.



Speakers

In total, this project has eight speakers, all reused from old electronic devices. Each of the speakers was selected according to the function that was assigned to it at the beginning of this project. For example, for the low-frequency bass centre pad, I used two subwoofer speakers, one 12-inch speaker removed from an old bass guitar amplifier, which produces deep vibrations, and the other is a 6-inch speaker taken from a home theatre system, which produces a clear bass hit. In addition to the subwoofers, I used a pair of speakers with different characteristics for everyday drum pads, and the goal for this decision was to simulation different sounds for every pad.



Amplifiers

For the LD1100, I used one main amplifier and complemented with a series of smaller ones to ensure sounds quality and audibility. The main amplifier used was removed from a totalled car and was bound to go to waste. It is fully functional and still performs as designed.



Motors

The reason I decided to use CD motors for this sculpture is to visually represent an old, yet working, technology that would place the audience in the intended mindset. The CD, as a part from the past is no longer a common part of technology used today and thus bringing it back to life for the audience will help situate them within the context of this project.



Power Supply

At the heart of this sculpture is a PC power supply that powers all the functions of this device. The reason I decided to use a PC power supply is because of its wide availability in homes and the variety of voltages and amperages it provides. For example, a common PC power supply provides three main voltages: 12V, 5V, and 3V, at an amperage between 20 and 30 amps.



Circuit

When it comes to connecting speakers to an amplifier, there are two types of circuits that can be built depending on impedance and voltage of the amplifier and its channels, series or parallel. In series circuit, the speakers share the 8-ohm channel and the total resistance is additive. So, two 8-ohm speakers wired in series will have a 16-ohm shared resistance. In a parallel circuit, on the other hand, the speakers divide the resistance, which is calculated by multiplying the resistance of the speakers and then dividing it by the sum of the all the resistance. So, two 8-ohm speakers will produce a total of 4-ohm resistance.

For this structure, I decided to use a parallel circuit in order to put less pressure on the amplifier and produce a clean sound that the users can hear and interact with. Also, since I am using speakers with different resistances, this approach protects the amplifier.

Instructions Manual

As stated in the introduction of this project, one of the main goals I set out for myself is to make this accessible by others. The way I want to achieve this is by limiting the parts to common parts that are safe and easy to use by people who are new to making. So, when creating the instruction manual, this approach was also considered as a guide throughout the process, and this is why the manual is highly visual, uses little technical terms and does not assume the readers to be highly skilled makers. When considering manuals for assembly or building, IKEA comes to mind as a successful example of accessible instructions manual that people with basic building skills can still understand and achieve a similar result as people with experience do. So, I decided to use the IKEA manual as an inspiration for creating the instructions manual for this project.

Results

First Iteration

Since this is an experimental design, the direction changed significantly after the first iteration was presented and the users' responses were observed. The first iteration of LD1100 was simply a 7-speaker stereo system made entirely from reused materials. The table top featured a discarded vinyl player that connects to a car amplifier then to the speakers. Although people appreciated the craftsmanship and concept of making something entirely from waste, I noticed that users did not interact with the object because the object offered no interaction, it simply played music. Without this interaction, the users, while they appreciate the object, did not reach the level of connection required for the activation to occur. I had to reconsider the interaction and consider new directions.



Second Iteration

After going back to the drawing board and restarting the ideation stage, I decided to transform the table from a stereo system to an electroacoustic percussion instrument that promotes interaction and play with the user. So, after removing the vinyl player from the table top, I created several drum pads that fit into the hexagonal shape. In addition to adding new drum pads, I also repurposed the CD motors from an old stereo system and placed them at the front of the instrument in order to trigger the audience's memory about a technology that is obsolete. Adapting the



instrument to its new function was a relatively easy process because of the modularity and adaptability of the design. After completing the additional six drum pads, the second iteration of LD1100 will be complete.

Going Forward

Roots was designed and built to be a permanent piece of furniture and constantly upgraded through the addition or replacement of its parts. So, depending on what I get to collect going forward I plan to find new functions and new effects to add to this instrument. For instance, I am planning to add the ability to play music while being able to play the drum along with the music. This interaction allows the user to have a rhythm to follow, which can be a fun interaction that is unusual for a drum.