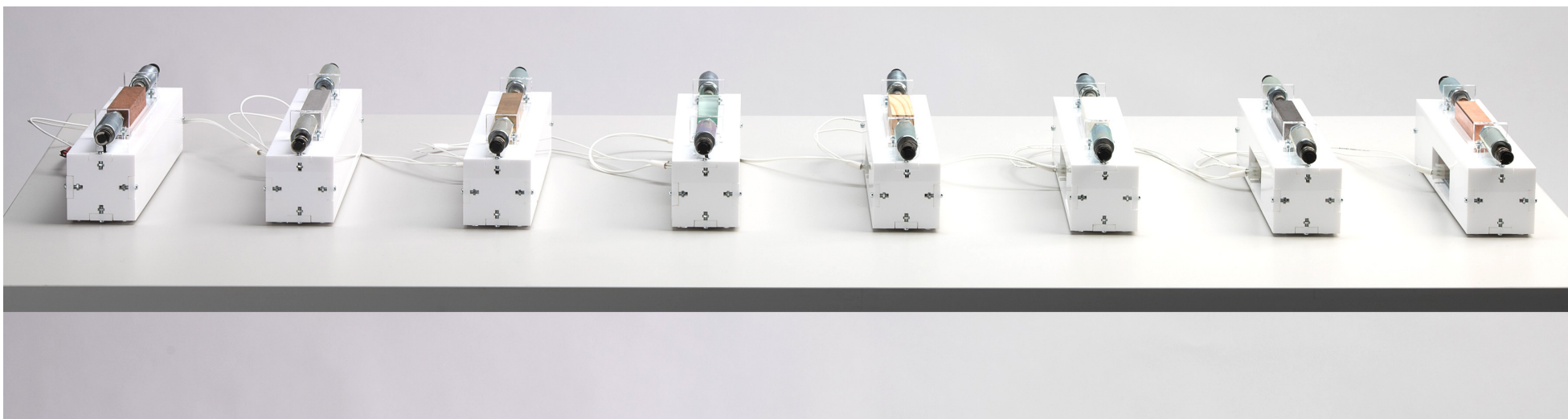


Material Music

Mo H. Zareei



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Artwork Description (extended)

"Material Music" is an audiovisual installation developed in an effort to underscore the significance of physical materiality within the field of object-based sound art. The work consists of a linear array of eight kinetic sound- sculptures, each of which is comprised of an electromechanically-excited block of solid matter. While all eight units are identical in terms of design, functionality, and aesthetics, they each utilize a different type of physical material: brass, copper, aluminium, steel, hardwood, softwood, glass, and marble.

In each unit, the material block is affixed on top of a rectangular box, with an identical electromechanical actuator mounted at both ends. The base box encloses the wiring, circuitry, and a custom-designed driver board that is connected to a micro-controller. The micro-controller is programmed to operate the actuators. Once an actuator receives a signal, its plunger shoots out and the small hammer that is screwed to the end of the shaft makes audible contact with the material block. As such, the only sonic material used in the work is derived from the mechanical actuation of the materials. In parallel, the materials themselves – and the entire mechanical process leading to their acoustic excitement – are on full display.

The piece is a process-based composition rooted in Steve Reich's pulse music and phase-shifting strategies. To further emphasize the role of the constituent materials, the phase-shifting criterion in "Material Music" is itself a derivative of a key sonic property of its materials: the speed of sound travelling through solid matters.

At the start of the piece, all sixteen actuators begin to excite the material blocks synchronously, at the rate of once per second (1 Hz). The left-hand side actuator in each unit continues to retain this rate during the piece. In contrast, the signals received by the actuators on the right-hand side of each block are subtly and continually delayed with each subsequent pulse. The delay time for each unit is derived from the speed of sound travelling through the specific material type, and is programmed into the micro-controller on the driver board. Accordingly, each sound sculpture operates based on a unique delay time unit, and with every pulse, the delay time between the left and right actuation instances grows by an increasing multiple of this unit.

As the piece develops, the accumulating delay times gradually shift the actuation pulses out of phase. With the passing of time, the delay offsets become more and more audible and visible. As the actuators on the left-hand side of the unit lock the downbeat to the strict rate of 1 Hz throughout, the actuations of the right-hand side solenoids are increasingly delayed, producing rhythmic patterns that morph in and out of phase across all eight sound sculptures. In this way, "Material Music" is a process-based composition that interlocks a steady pulse with ever-changing phasing audiovisual patterns that themselves derive from the very essence of the constituent audiovisual materials.

Online video excerpt can be found at:
<https://vimeo.com/375826829/048c4290c3>

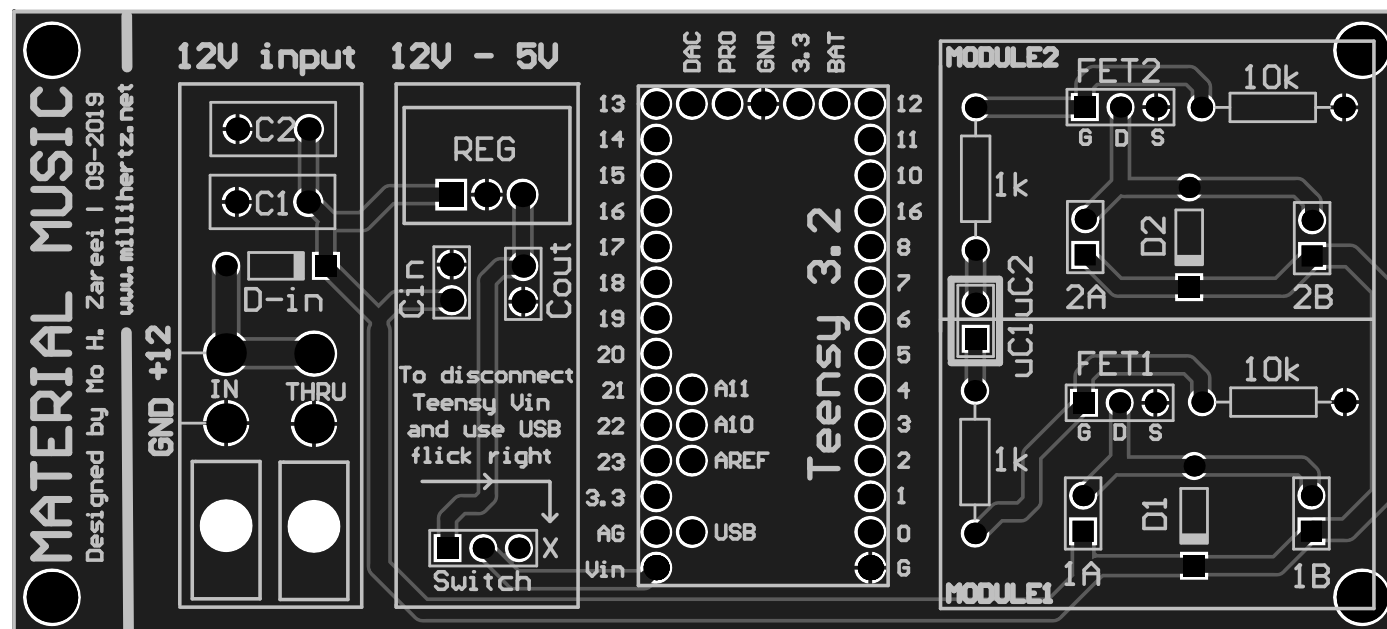
Technical Details

Actuators: push-type solenoids

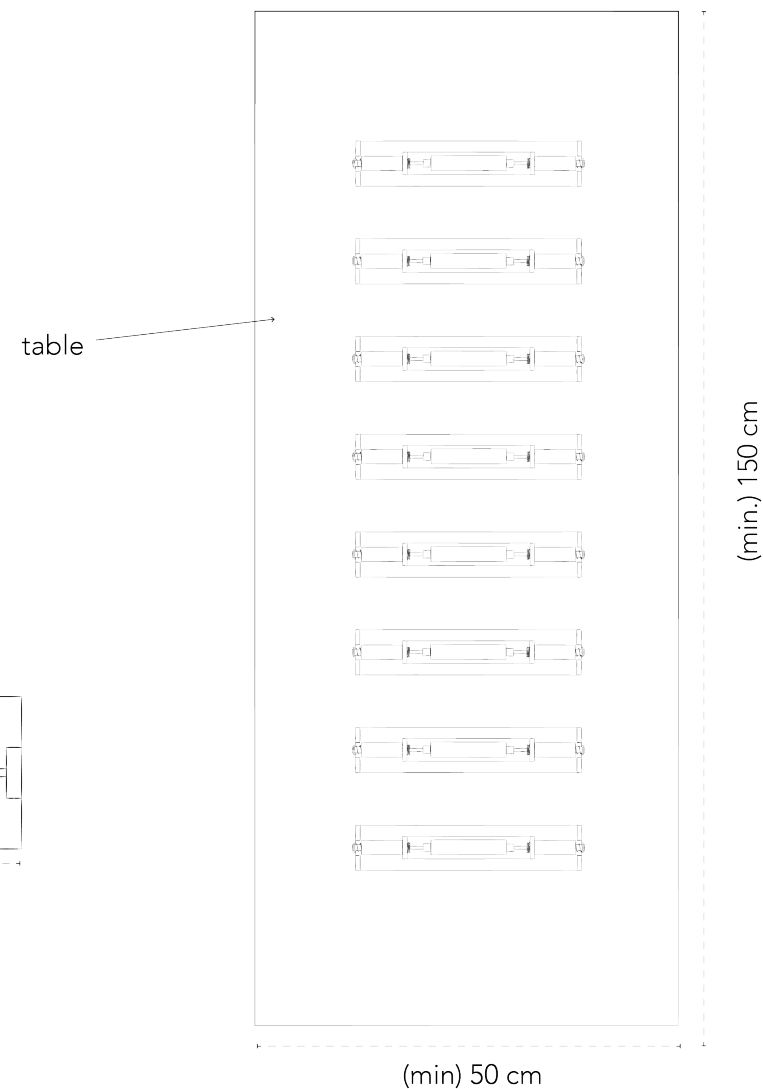
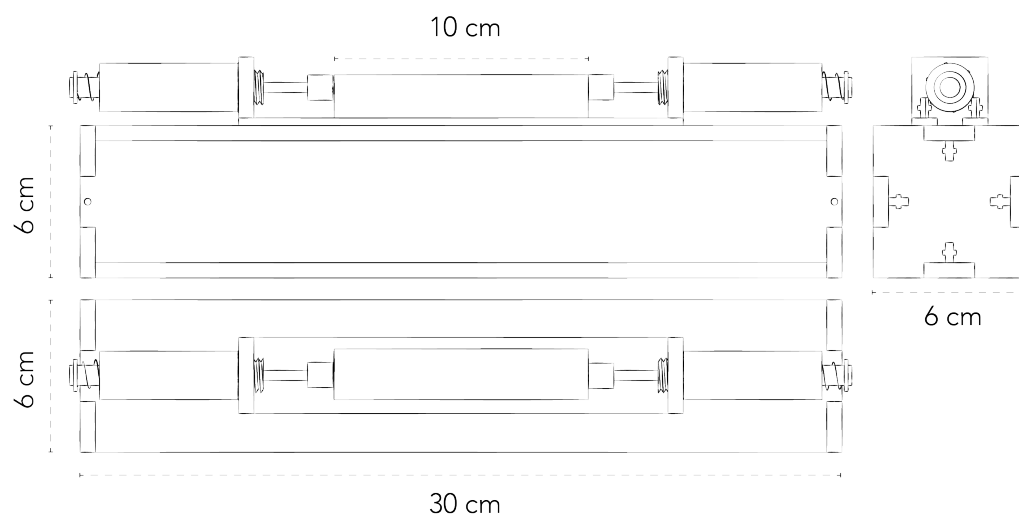
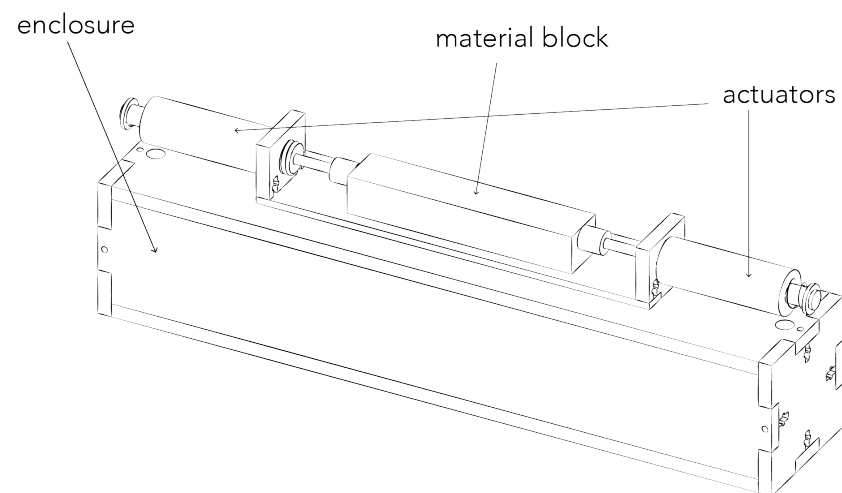
Enclosures: acrylic, lasercut.

Materials: aluminium, brass, copper, glass, marble, still, softwood, hardwood.

Electronics: Custom-designed PCB (driver board), Teensy 3.2 microcontroller, 12–18V DC power supply, wiring.



Technical Drawings & Dimensions



LOGISTICAL REQUIREMENTS

The installation involves continuous acoustic sound generation (i.e. no volume control). Therefore, it is important that the work is installed at a location that it does not negatively impacts, or is impacted by any surrounding activities. The preferred scenario would be a semi-isolated space/zone where the audience can enter and engage with the work, and leave as they wish (ideally a white cube / black box).

In addition to the sonic considerations, the realization of the work will require:

- A table with a flat, plain, and clean top (no black cloth) and the following dimensions: length (min. 150cm), width (min. 45cm), height (min. 90cm) (Alternative to this would be a series of 2, 4, or 8 identical plinths that can be stacked on the side of each other, and cover the same dimensions in total. A plain industrial and/or minimalist look is preferred.)
 - One power plug.
 - Controllable lighting.
-

Set up time: 4 hours. Ideally, the set up will take place a day before the installation opening. Having an assistance during the setup would be appreciated but not crucial.

The piece has been finished very recently. At this stage, it is undergoing a number of stress tests and has proven to be stable over several hours. Nevertheless, since the work involves constant mechanical action, movement, and friction, it would be preferred that it is not on display for extremely long hours over a long period of time.

I will have some basic hand tools on me. But having access to a technical workshop and/or basic tools such as soldering iron would be a significant bonus (in case there are any damages during international transfer).