

JORDAN
NAHM

Personal Portfolio

JORDAN NAHM

DML Speaker

This is a Distributed Mode Loudspeaker, it uses a thin, light, flexible board in vibration to emit sound. This is different from a traditional cone speaker in that it has near omni-directional sound transmission rather than uni-directional transmission. It also produces a more even band of output. This design attempts as thin a free-standing profile as possible. The unobstructive frame also reduces any damping of audio emanations by the frame.

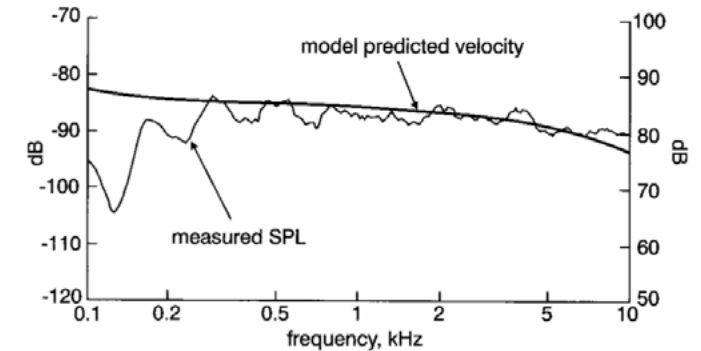


Fig.7 Velocity of DML panel and exciter from model, with measured SPL at 1m

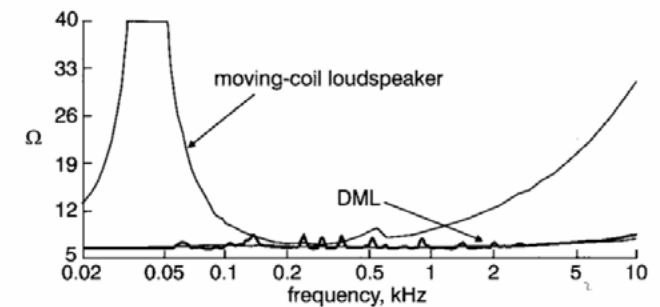


Fig.6 Terminal impedance of DML panel with exciter from model compared with measurement and cone drive unit of same nominal impedance

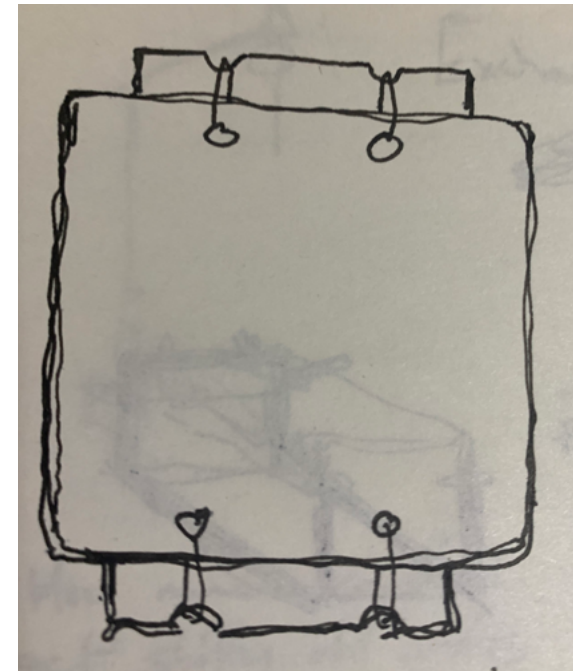
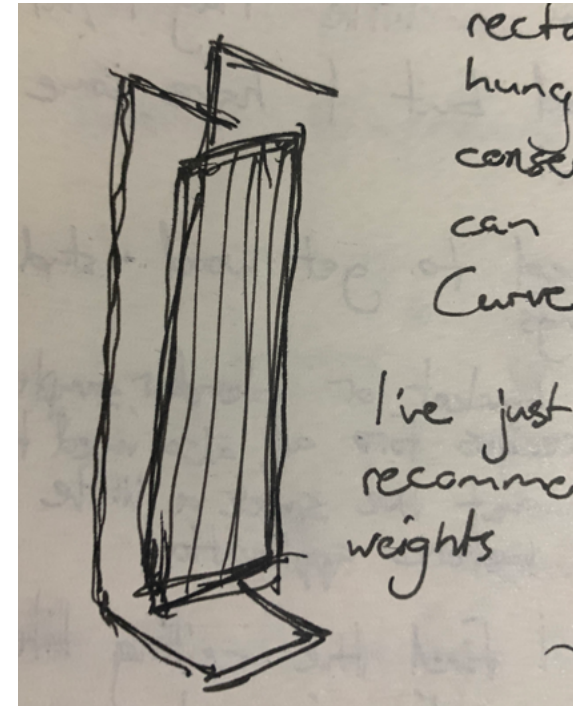
JORDAN NAHM

DML Speaker Process

The form went through many iterations before the least but effective design was determined. Initially inspiration was drawn from classic architecture. A soundboard such as that used in a DML is most capable of transferring sound when it is supported without any fixed edge.



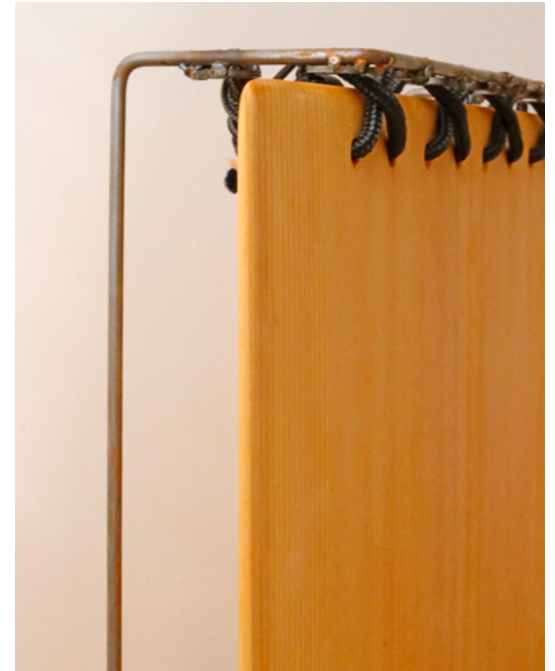
Because DML technology affords a wider projection of sound, care was taken not to inhibit this emanation with the support structure. A woven pattern was later devised which would distribute tension, and in a visually pleasing way. Suspending the soundboard and hardware with tethers, is ideal for optimizing audio output. The design effectively fills a room with this uninterrupted sound distribution.



JORDAN NAHM

DML Speaker Construction

The soundboard is made from Sitka Spruce that is sanded smooth on the surface and edges and finished with tung oil. A mild steel frame was selected for ease of manufacturing and for strength. The frame was made by bending rod into two halves and then welding them and the 16 mounting points. When horizontal, the design becomes a platform upon which sound can be experienced in a richer way. Users can place fine particles on the surface and watch how they scatter from the vibrations.



JORDAN NAHM

BDTable Lamp

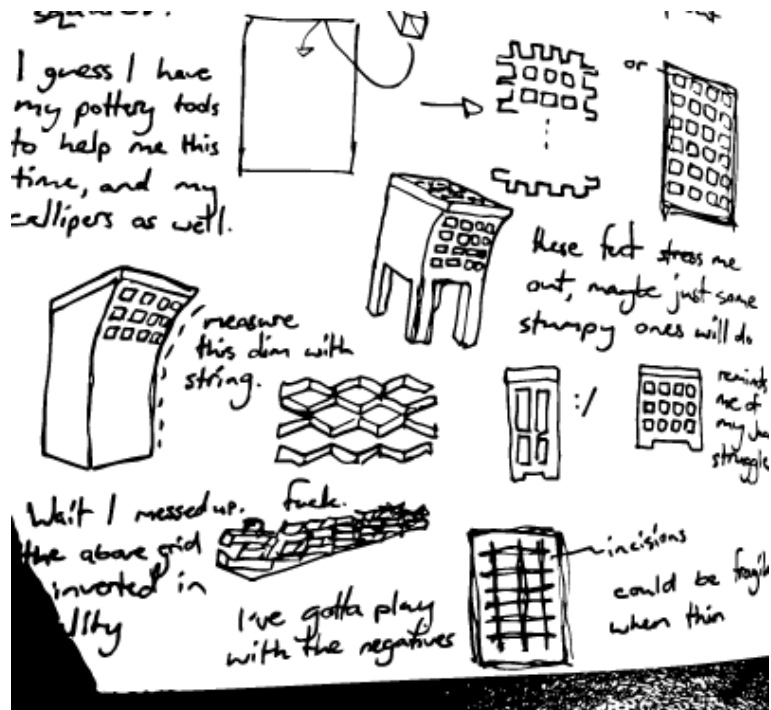
This project is an experimental desk lamp. The body was constructed from plaster of paris cast in a raw clay mold. Through reflection, the strong LED source is hidden from the eye while light is channeled through the body and utilized on the desk space. It occupies a very small portion of the desktop and possesses a charming character as a result of the involved manufacturing process.



JORDAN NAHM

BD Lamp Form Concept

The form was conceived as a hollow column with curvature applied to the floor and ceiling of the internal cavity. The internal cavity is thus periscopic, relying on a glossy white finish to reflect light. The form is a channel for light. The short legs give a quirky feel to the form which makes it more approachable and tacit. The rough

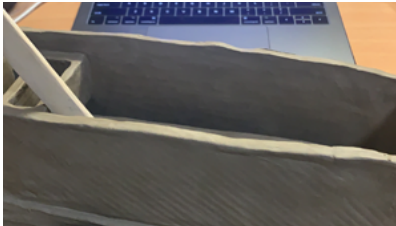


and handmade feel of the plaster makes the sculptural design appear primitive. It appears as an organism and as some simple domicile.

JORDAN NAHM

BD Lamp Technical Details

The lamp uses a safely designed passive heat sink which keeps the LEDs below 85 degrees Celsius. By incorporating the module within the form, the heat sink is directly exposed to ambient air. The inertness of the body material eliminates any chance of electrical shock. Further iterations are to be carried out in ceramic.



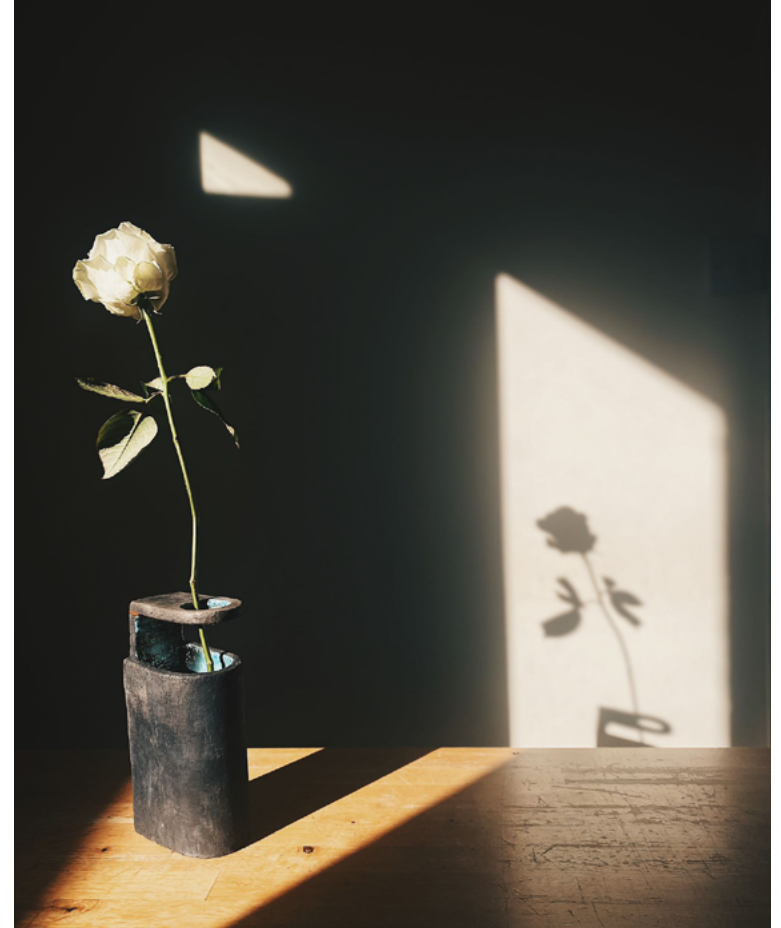
JORDAN NAHM

Ceramic Studies

This collection investigates the physical and aesthetic properties of ceramic material and how they can be utilized in design. The range of applications for which ceramic is suitable range from architecture to kitchenware and tools. Ceramic is resistant to thermal, acoustic, and electrical energy as well as to scratching and chemical damage.



cow tray



raku vase

Ceramics are an ancient craft and so many techniques are already recorded. Clay is extremely sculptable and by leveraging manual labour a human impression can be supplied for great for affective designs, some are very simply effective. This is especially the case when combined with efficient firing methods.

JORDAN NAHM

Ceramic Studies continued



tenmoku teacup



lotus plate

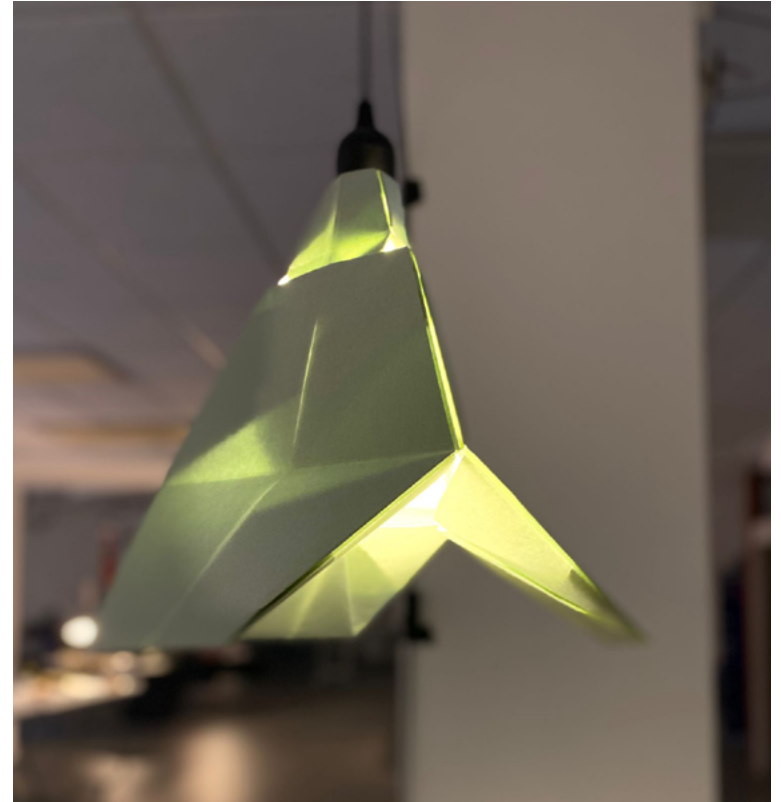


capsicum cup

JORDAN NAHM

Green Lamp Shade

This design utilizes the calming sensation of green light to create an atmosphere with greater repose. The design is constructed from repeating origami units known as sonome. The form is simple and rests gently in suspensions like something botanical. Paper is a classical material for cost-effective lighting and capable of many unique forms when it is folded.



JORDAN NAHM

Furniture Concept Comissions

These designs were commissioned for interior design firms and private clients. Their forms were determined through discussion with the client and the principle designers of the studio at the time. These concepts take the forms of renders and a 1:1 scale prototype.



JORDAN NAHM

Dynamic Light Solutions

There are unique favourable lighting climates for humans at any given point of the day, based on how our body uses light to tell the time. Even plants, such as the *oxalis triangularis*, exhibit photonasty, or physiological responses to light. This plant ceases the support of its leaves when in the dark in order to conserve energy at night. Similarly, the human body uses light to regulate its hormone production according to time.

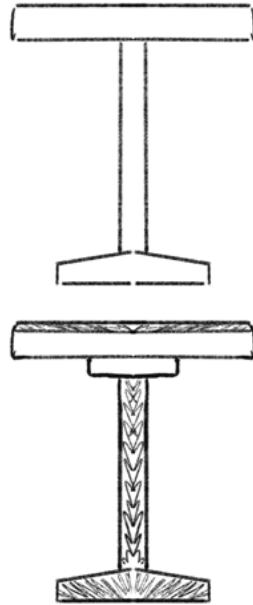


The lamp designed and built provides dynamic ambient light by changing its colour temperature to accommodate the human eye. In this way the user will be less exhausted by using the lamp at any hour of the day. For this reason such a lighting system should be encouraged in all modern light sources, excepting those required for clean task light such as kitchens, where consistency is a necessity.

JORDAN NAHM

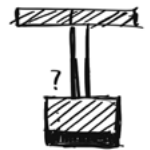
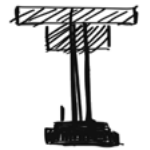
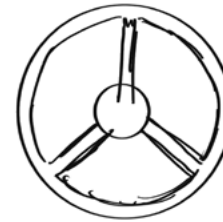
Dynamic Light Concept

While researching interior lighting, I discovered in a paper by researchers at the Korean Advanced Institute of Science and Technology that exposure to light with a blue colour temperature early in the morning helps to bring our bodies to an alert state. In the evening however, warmer light is preferred so as to prevent exhaustion from alertness; yielding a poor sleep cycle. Thus the designated requirement for the lamp was to emit light with a scheduled colour temperature.



Form Requirements:

- specified height for living areas and working areas
- intuitive brightness control
- Top-heavy like a plant
- Downward light



surface
quality?

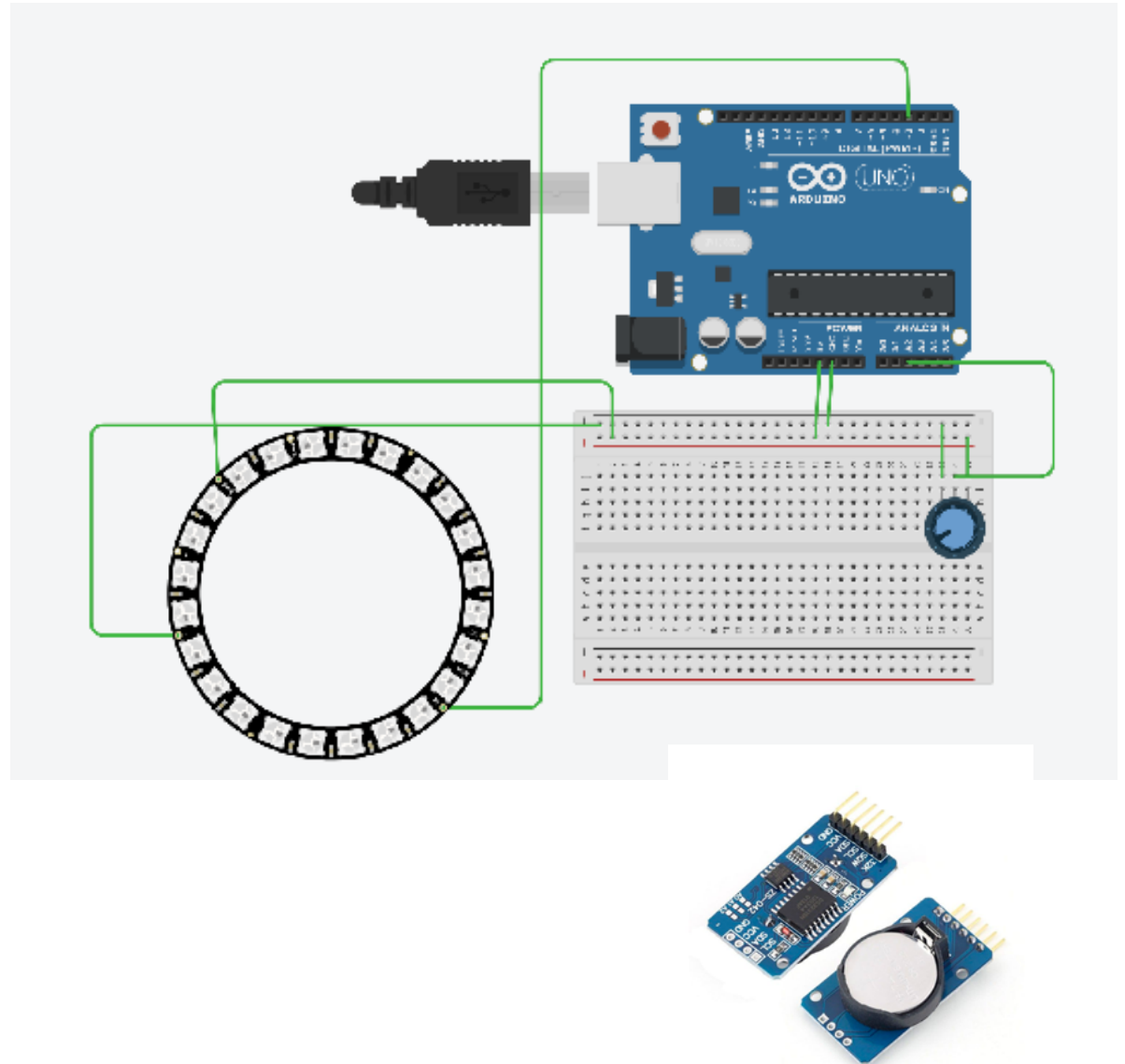


JORDAN NAHM

Dynamic Light Circuit

The circuit implemented was quite simple in principle. Brightness is controlled via an analog input wired to a potentiometer knob, while a real-time clock (RTC) with a separate power source allows the circuit to account for time change.

When the RTC hour value is between 9:00 and 20:00, the colour temperature is 5500 Kelvin or (255, 236, 224), which is commensurate with daylight. In the evening the value is updated to (255, 109, 0). This is equivalent to 1500 Kelvin; candlelight. From midnight until 10:00 the LED ring RGB value is set to (214, 255, 255). This is the equivalent of 9000 Kelvin, the colour temperature corresponding to a blue sky. The RGB values chosen were researched, and tested.



JORDAN NAHM

Dynamic Light Construction

Parts were CNC milled or cut and ground from aluminum plates and tubes. Because the structure was designed to minimize constructional complexity, there were only three points which would require intervention for fastening.

Aluminum was selected for the exterior to be corrosion resistant and lighter than steel. The material selected for the diffuser was PETG, printed with a translucent quality to make the light feel more organic.



JORDAN NAHM

Second Dynamic Lighting Solution

- With this project I was able to obtain further knowledge on a more considerate form system of interior lighting.
- This lamp was tested by a student body which reported improved performance both quantitatively and qualitatively.
- Target values were narrowed down for emission and quality.
- The lamp was designed to provide the most suitable light for every time of day at any time of year.
- RGB LEDs are awkward when it comes to emitting even light, hence the employment of white LEDs.

