Theory of Operation

The Nakaya Electronics are composed of a mainboard that has a ItsyBitsy32u4 microcontroller socketed into. The mainboard connects to 4 sensor boards and 4 led light boards. Each Sensor board has 12 reed switches that are read by 2 shift-in registers. Each light board has a 24 rgbw neoPixel ring attached. The software for the microcontroller checks each Sensor board for the snow pucks that correspond as a correct answer to the description of the snow for that section. Each section has 2 answers that work. When a correct answer is placed in the slot the light board fades in a light in the center of the snowflake and the mainboard triggers a sound. When the piece is removed the light fades out.

Parts list

| **Description** | **Serves/Location** | **Part #** | **Vendor** | **Quantity** |
| --- | --- | --- | --- | --- |
| ItsyBitsy 5v 16Mhz | Microcontroller for main pcb | 3677 | Digikey | 1 |
| Wav Trigger | Plays Audio Sounds | 1568-1115-ND | Digikey | 1 |
| SanDisk 16GB microSDHC | Holds wav audio files | SDSQUAR-016G-GN6MA | Amazon | 1 |
| Kinter k3118 | Audio Amplifier | k3118 | Amazon | 1 |
| DPI 4" waterproof speaker | Plays sounds | DPI-60B | Amazon | 1 |
| Meanwell 5v 14a PSU \* | Power supply for electronics | LRS-75-5 | Digikey | 1 |
| Neopixel RGBW 24 LED ring | Led light for puck slots | 2862 | Digikey | 4 |

Troubleshooting

| The unit is not powering on. | 1) Verify that the power strip switch is in the on position.  2) Verify the main board inside the beige enclosure is receiving power. It has a red power led that will be lit.  3) Verify that the power cable wires are firmly connected to the green phoenix connector screw terminals. |
| --- | --- |
| Led light is not lighting up when a correct puck is inserted into its corresponding slot, but audio sound plays. | 1 ) Try reseating the connections on that sensor board and the main board.  2) Verify that those connectors have their wires firmly connected to the screw terminals. The phoenix connectors on the sensor boards can be removed by pulling them straight down. |
| The audio is not being played when a correct puck is inserted into its corresponding slot | 1) Check to make sure the power supply for the amp is firmly plugged into the power strip. The amp will glow blue when it has power and is on.  2) Check to make sure the kinter amp is on and the volume is not all the way down. The big knob is the volume knob.  2) Check to make sure the white rectangular connector in the center of the mainboard is plugged in all the way.  3) Check to make sure that the rectangular connector on the wav Trigger is plugged in all the way. Through this connector the wav Trigger receives power and data.  4) Check that the 3.5mm aux cable is plugged in all the way into the wav trigger and the kinter amp. |
| The volume is too quiet or too loud | 1) Inside the cabinet is a kinter amp. The amp has a big knob with a blue led around it. This knob can be used to adjust the volume. |