Requirements

Flash an LED light for half a second whilst playing white noise. The flashing/noise should repeat with random intervals of 2-6 seconds.

Equipment:

Arduino R3 Mega or equivalent with USB-A to USB-B cable (£16)

e.g. https://www.amazon.co.uk/ELEGOO-Controller-ATmega2560-ATMEGA16U2-Compatible/dp/B06XKMZ3T9

Selection of multicolored dupont wires (£6)
https://www.amazon.co.uk/Elegoo-120pcs-Multicolored-Breadboard-arduino-colorful/dp/B01EV70C78

Seeed Grove Base Shield (£4.50)

Grove - Base Shield V2.0 for Arduino | The Pi Hut

Seeed Grove LED Strip Driver (£10)

Grove - LED Strip Driver | The Pi Hut

Seeed Grove SD Sheild (£14)

https://thepihut.com/products/seeed-sd-card-shield-v4-0

Small 16ohm/1W speaker (£4)

https://www.ebay.co.uk/itm/276483867624

Variable power adaptor (with USB socket built in) (£10)

https://www.amazon.co.uk/dp/B0829R1GD7

SD or Micro SD Card under 2GB (£7 or from an old phone/camera from 2005)

https://www.amazon.co.uk/Hama-High-Speed-Secure-Digital/dp/B000BGFJI6

White LED strip light with just +ve and –ve connections. (£10)

https://www.amazon.co.uk/PAUTIX-Dimmable-Backlight-Flexible-Lighting/dp/B08XBDHSZW

Preparation & Notes:

The LED strip driver required its own power source and the variable power adaptor with built in USB allowed for a us to use the main output with the screw terminal connector to power the LED strip driver and for the USB-A to USB-B cable to power the Arduino base unit.

From the LED lights, cut 3 x 6 LED sections. These will need to be soldered in series to connect the ground/positives together from each alternate end. I left the initial power supply wires with the male DuPont pins connected for ease of connection to the LED strip driver.

The white noise WAV file was created based of these instructions: [Music Player Using Arduino : 5 Steps - Instructables](#)

The speaker supplied by the client needed the wires soldered, as opposed to the example in the link above which could connect without soldering.

My soldering iron and skills are poor, and I had issues getting the solder to stick to the LED terminals. So, to help endure connections, I bodged all the soldering with the help of a hot glue gun.

There is no doubt a cheaper/simpler way to create this if you use individual capacitors and resistors etc.

Initial Assembly

Boards

With the Arduino as the base, plug the SD shield in first and then the base shield on top.

Speaker

Connect one speaker wire to Pin 6 on the base shield and the other to one of the ground GRD pins.

LED lights and Driver

Connect the ground wire to the 'G' terminal of the LED strip driver and the positive wire to the '+' terminal of the LED Strip driver. Using stripped down cables, connect the power supply from the screw terminal adaptor that came with the power supply.

With the cable that came with the LED strip driver, plug one end into the strip driver input and the other end into the top of the base shield in plug D2.

The Code

Ardino Pins used:

Pin 6 – speaker wire 1

GND – speaker wire 2

The final code is a slight mash-up of the examples given with the RGB driver & LED Strip libraries.

The code loaded for customer delivery:

```cpp
#include <SD.h>                          // need to include the SD library
//#define SD_ChipSelectPin 53  //example uses hardware SS pin 53 on Mega2560
#define SD_ChipSelectPin 4  //using digital pin 4 on arduino nano 328, can use
other pins
#include <TMRpcm.h>           //  also need to include this library...
#include <SPI.h>
#include "RGBdriver.h"
#define CLK 2//pins definitions for the driver
#define DIO 3
RGBdriver Driver(CLK,DIO);
TMRpcm audio;

void setup(){
  audio.speakerPin = 6; //5,6,11 or 46 on Mega, 9 on Uno, Nano, etc
  Serial.begin(9600);
  if (!SD.begin(SD_ChipSelectPin)) {  // see if the card is present and can be
initialized:
    Serial.println("SD fail");
    return;   // don't do anything more if not
  }
}

void loop(){
  int interval = random(2000,6000);
    Driver.begin(); // begin
    Driver.SetColor(0,255,0); //Green. SetColor(R,G,B) - Red cable from LED goes
to top pin 'G', Yellow cable goes to bottom pin (+) of LED output
    Driver.end();
      audio.play("burst.wav");
          delay(500);
      audio.pause();
    Driver.begin(); // begin
```
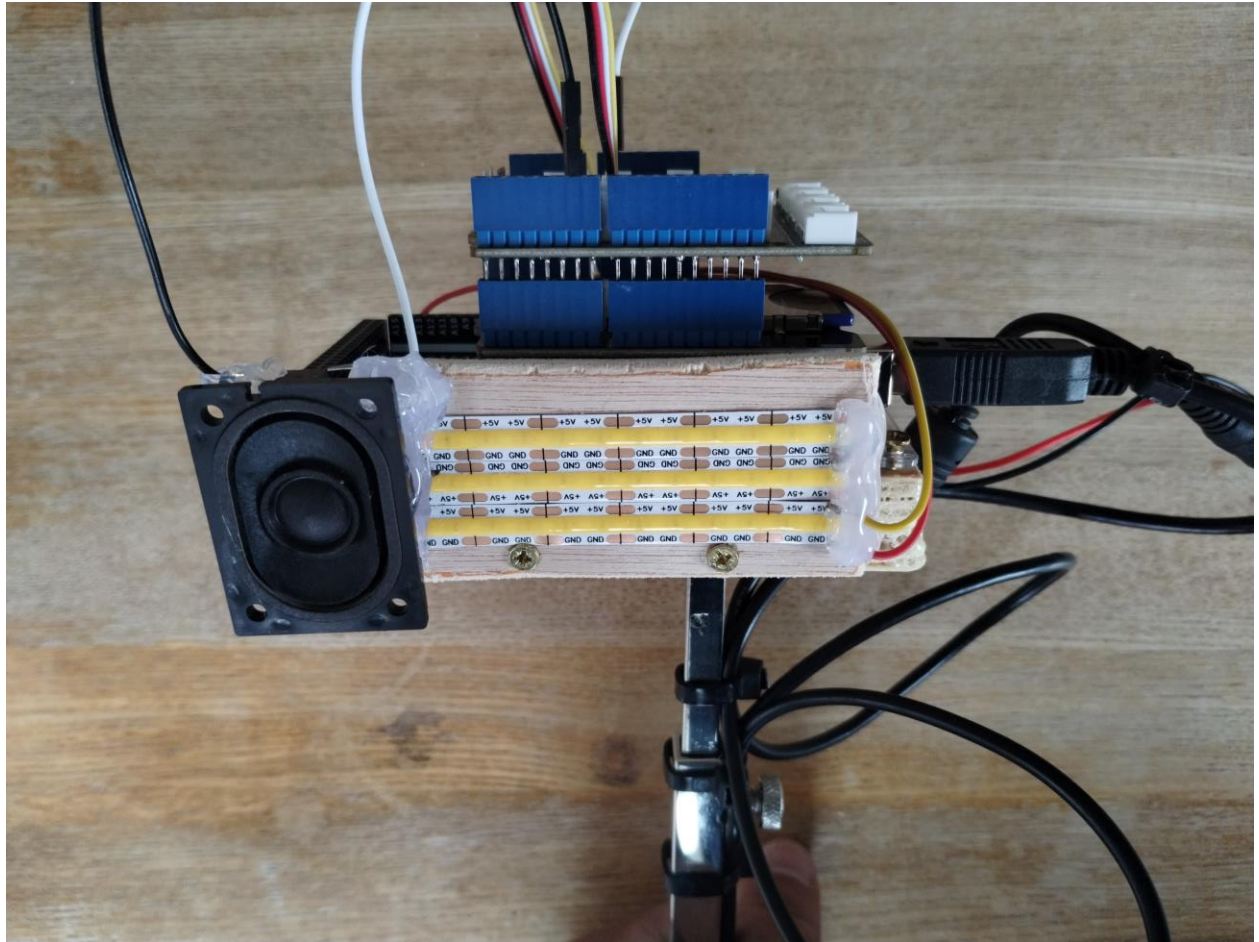
```
    Driver.SetColor(0,0,0); //switch light off - SetColor(R,G,B)
    Driver.end();
    delay(interval);
}
```
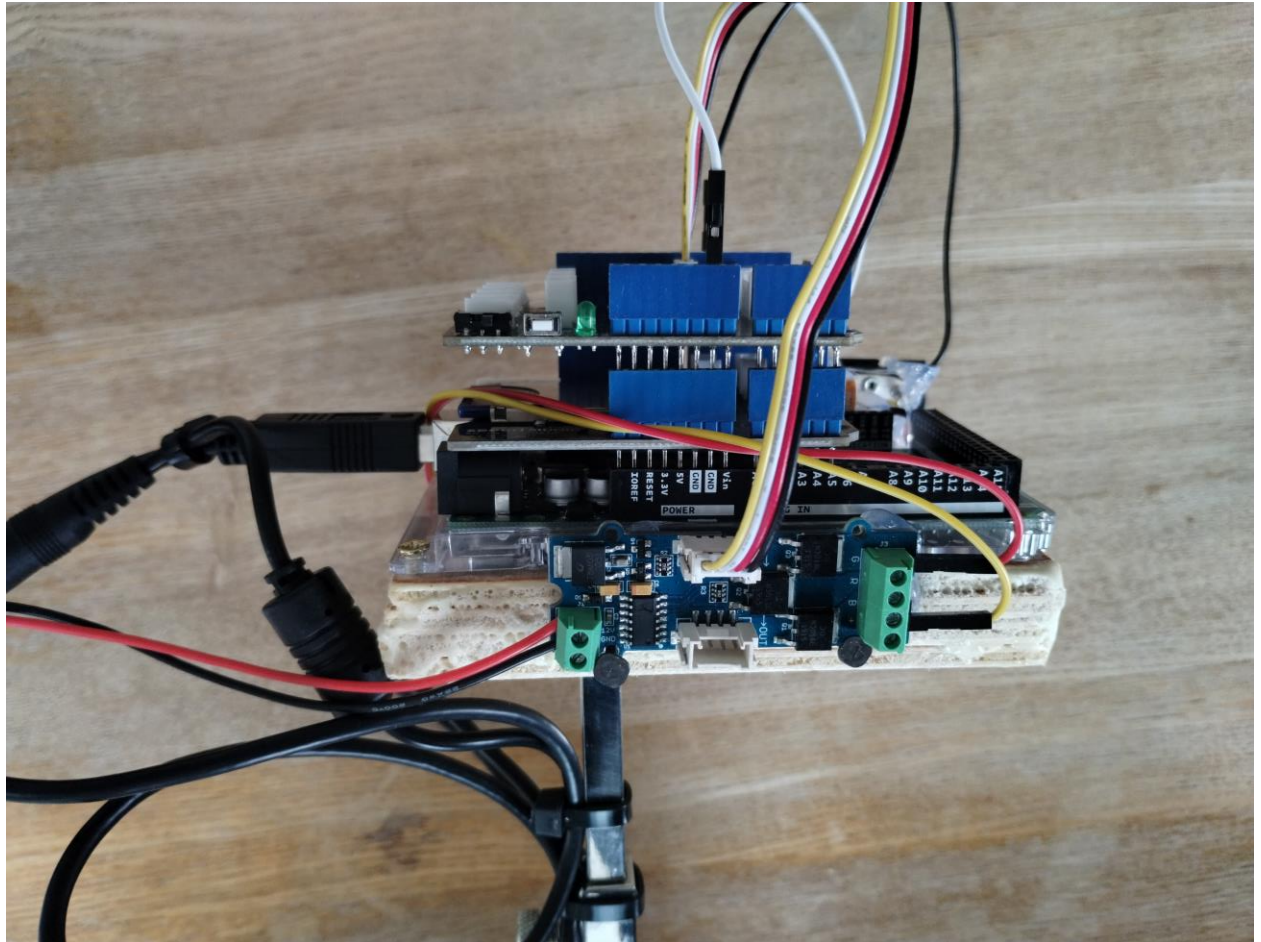
Final Assembly

Side view – all attached to the adjustable stand
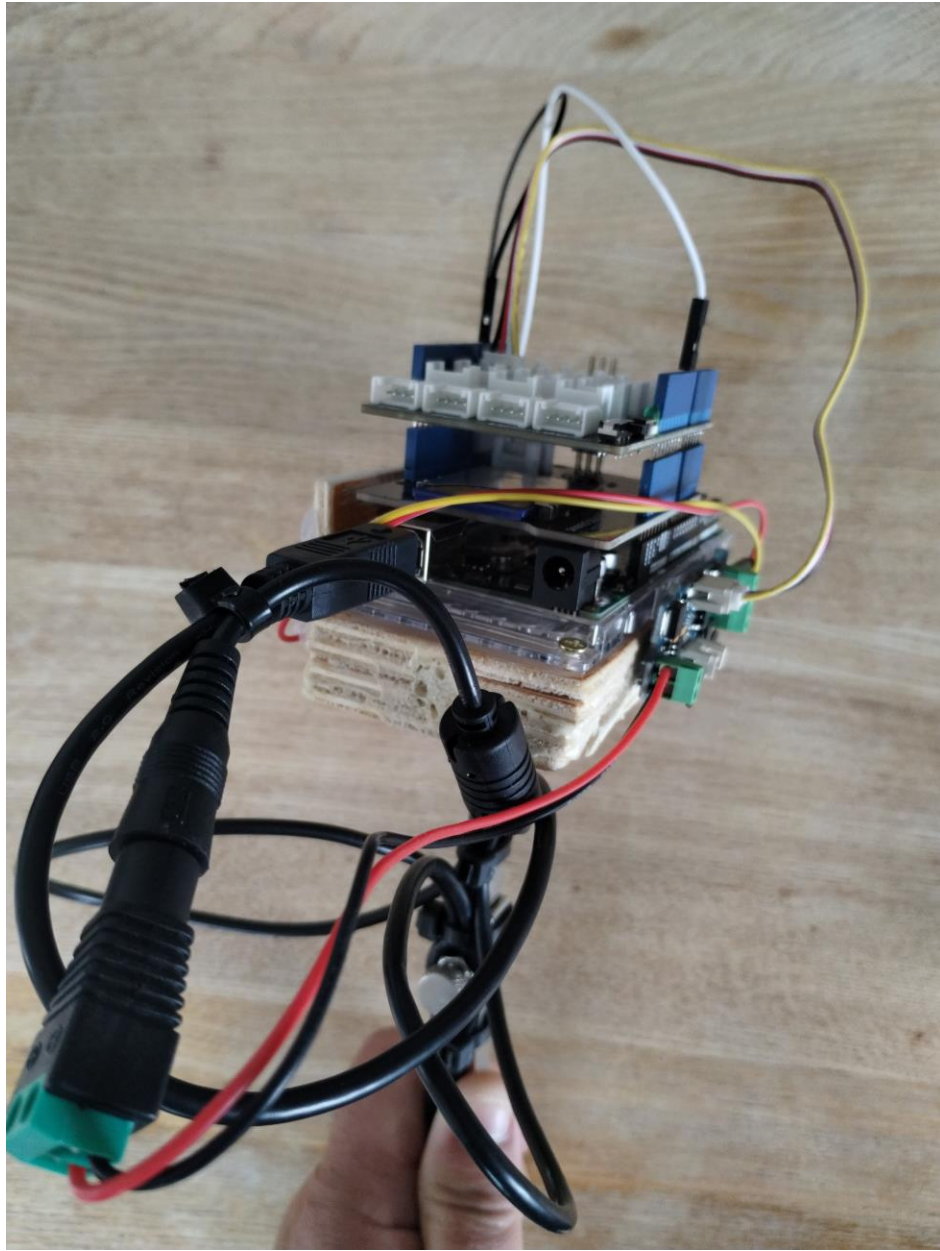
Top View

LED's and Speaker attached to the side

LED Strip Driver

Power supply

Additional References

For the SD Audio Library [GitHub - TMRh20/TMRpcm: Arduino library](#) and parameters: [Home · TMRh20/TMRpcm Wiki · GitHub](#)

LED Strip Driver Library: [https://files.seeedstudio.com/wiki/Grove-LED_Strip_Driver/res/LEDStripDriver_library.zip](#)

The Code – initial development.

Basic code to generate white noise:

Initial attempts to generate the white noise by using basic code to generate random noise worked fine on its own, however as soon as it was in a delay loop with the LED code the 'white noise' stsopped working and only gave a wee clicky noise.