Matrix Clock Connections

1. MX matrix for Arduino Mega
   1. CLK\_PIN 52 on Arduino
   2. DATA\_PIN 51
   3. CS\_PIN 53
   4. Vin 5 v
   5. GND
2. 2nd MX matrix (See notes below – one of three optional 2ndary time display options)
   1. CLK is also 52, don’t ‘chain’ it off primary display – connect both displays directly
   2. DATA (DIN) also Pin 51, but again – connect directly, not chained
   3. Vin
   4. GND
   5. CS\_PIN 49 – each display gets its own CS
3. FX Sound Board
   1. Vin 5v
   2. GND
   3. ACT Pin to Arduino Pin 8
   4. Sound Board Pins 0-9 to Arduino Pins 30-39
   5. Speaker outputs to 8 ohm speaker
4. MPL115A2 Barometer
   1. GND
   2. Vin 5v
   3. SDA on Arduino
   4. SCL - same
5. RTC DS3231
   1. GND
   2. Vin 5V
   3. SDA on Arduino
   4. SCL on Arduino
6. Push Buttons for Set, Up, Down and Demo mode (SPST Momentary)
   1. One side of each switch to GND
   2. PB1 = Set, to Arduino pin 2
   3. PB2 = Up, to pin 3
   4. PB3 = Down, to pin 4
   5. PB4 = Demo to pin 7
7. Automatic Shutoff at Nite (ANSO) toggle switch (SPST)
   1. One side to GND
   2. One side to Arduino pin 10
8. Wifi / NTP time switch – toggle switch (SPST)
   1. One side to GND
   2. One side to Arduino pin 11
9. Westminster/Chime toggle switch (SPDT Center Off)
   1. Center connection to GND
   2. Upper connection (Westminster) to Pin 5
   3. Lower connection (Bell only) to Pin 6
   4. Sounds loaded onto FX SoundBoard in OGG format
      1. T0 – Short single Westminster Chime
      2. T1 – Westminster 15 minute
      3. T2 – Westminster 30 minute
      4. T3 – Westminster 45 minute
      5. T4 – Westminster hour
      6. T5 – Trailing (longer) Westminster Chime – plays last in sequence
      7. T6 – Short Single bell chime
      8. T7 – Trailing (longer) single bell chime – plays last
      9. T8 – Boot up sound (plays when powered up to signal sound is working TaDA sound)
      10. T9 – Game of Thrones theme to play during Easter Egg Display
10. LDR photocell (see diagram)
    1. GND
    2. Vin 5v
    3. Pin A0

Diagram, schematic

Description automatically generated

1. DHT 11 or 22
   1. Pin 4 to GND
   2. Pin 1 to 5 Vin
   3. Pin 2 (Sensor pin) to Arduino pin 9 AND to Vin (or Pin 1) through 10K resistor

A circuit board

Description automatically generated

1. Co-Processor (ESP 8266)
   1. Vin 5v
   2. GND
   3. ESP8266 Pin D4 [IDE alias pin 2] To Arduino Pin 23 (polling pin)
   4. ESP8266 Pin D2 [IDE alias pin 4] To Arduino SDA
   5. ESP8266 Pin D1 [IDE alias pin 5] To Arduino SCL
2. If using four 8x8 independent matrix displays instead of 2nd MX7219
   1. Ensure each of the four has a different I2C address
   2. Connect all to Vin 5v and GND
   3. Connect each to the Arduino SDA and SCL pins
3. If using a four segment numeric LED (e.g. 1.2” display) with IC2 backpack instead
   1. Connect to both V0 and Vin to 5v Vin
   2. Connect GND to GND
   3. Connect SDA to Arduino SDA
   4. Connect SDL to Arduino SDL
4. Power
   1. Use 4-5 amp power adapter with 5v output
   2. Create a bus for + and –
   3. Connect all Vin 5V to the + side of bus
   4. Connect All GND to – side of bus
   5. Connect Arduino Mega Vin and GND to the bus as well (in other words, don’t power anything through the Arduino)